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ORNITHOLOGICAL NOTES FROM NORFOLK FOR 1899.

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(ASSISTED BY SEVERAL OTHER NATURALISTS.)

PLATE II.

THE rarities for the year have not been many, and one cannot but be impressed with the growing scarcity of the Hobby, Kestrel, Magpie, Quail, Woodcock, Ruff, Spotted Crake, Bittern, Teal, Garganey, and Wild Duck. 1899 seems to have passed without the record of a single Waxwing, Black-tailed Godwit, Spotted Crake, Eider Duck, Glaucous Gull (last visitation 1895), Great Northern Diver, or Fulmar Petrel, and with very few raptorial visitants. The Rev. M. C. Bird tells me of one male Hen-Harrier seen in November among the Broads, and he saw or heard of an Osprey in May; other correspondents record two of these splendid Eagle-fishers in October. Hardly any Buzzards came over, and since the Buzzard years of 1881 and 1896 they have been conspicuous by their absence; it is also a good many years since a Goshawk has appeared.

On Jan. 13th, after a gale in the night, I picked up a Mistle-Thrush which had been dashed against the keep of Norwich Castle, and a Hawfinch at Kirby Bedon met its death in a somewhat similar way. Some young Grey-headed Wagtails passed about Sept. 1st; Crossbills have been reported here and there,

and Grey Wagtails as usual. There were no Bluethroats, and Snow-Buntings were scarce (H. N. Pashley); but my correspondent speaks of "foreign Blackbirds," and hundreds of small dark Thrushes in October, an appearance perhaps more due to the locality than the size of the birds themselves. A Black Redstart was identified in October, and another in November (Pashley), and on Nov. 7th Mr. Ramm feels certain of having seen an Ortolan Bunting. Whether this identification can be trusted I cannot say, but the wind the day before had changed to the north-west.

The only Lapland Buntings were two in October, but many Long-tailed Tits were observed, and in one place they were even seen coming off the sea. November was rainy and unsettled up to the 11th, but it was too late then to much affect migration, as most of the species had passed, though flocks of Little Auks and other *Alcidæ* were seen at sea. Three or four Grey Shrikes paid their customary autumnal visit, and Mr. Arthur Patterson had two Quails to announce in that month.

Although I have diligently written down the direction of the wind in my journal nearly every day, there was so little autumnal migration that no results have been gained. The principal movement was during the first week in October, when there were so many Grey Plovers; and at the same time, *viz.* on the 4th of that month, something like a rush was observed in North Lincolnshire by Mr. Caton Haigh (*cf.* p. 112).

On Dec. 10th the first snow came with a light west wind, and so rapid was the drop that night that the thermometer in my parish marked two degrees above zero. A profusion of Ducks, Snipe, Water-Rails, Water-hens, &c., immediately appeared on the meadows adjacent to the Norwich rivers, and every gunner sallied forth bent on destruction. Half-starved Mistle-Thrushes flocked to the yew trees in my garden, as many as nine of these great birds hanging on or around one small Irish yew; but already the red berries (which were in masses a week before) were falling off. Barn-Owls, persecuted at all times, suffered more than ever, and a good many Kingfishers were slaughtered; but our Norwich birdstuffers have the good sense to refuse to buy either the one or the other. On the 12th two guns shot forty Snipe in an afternoon at Carrow, and the next day, on the same



ground, made up a bag of ninety-one Snipe, thirty Plover, and four Duck. News came to hand of many flocks of Ducks passing high overhead in different parts, but especially near the coast, beyond the reach of guns. Fowl of all kinds came to Norwich, and a basket of Mallard which I saw unpacked contained a nice pair of Gadwall† from Lynn, and in another lot two Shovelers† from Ranworth. These Gadwall are the first I remember to have met with in Norwich Market, while a few days afterwards two more were shot near Salthouse, and some Pintails (Ramm). In Lubbock's time Gadwall came to Norwich Market every winter. A few fine Goosanders appeared about the 20th (E. Saunders), but only two Smews.

Mr. Arthur Patterson, writing from Yarmouth, and giving a description of the hard weather and its effects, says :—" Dec. 14th, birds are plentiful; yesterday crowds on Breydon Broad. Snipe rushed in after the snow; on the 10th they invaded the marshes, and on the 11th began to appear in Yarmouth Market," where the chief salesman, Mr. Durrant, gave Mr. Patterson the following particulars from his week-book of birds bought. This table could be compared with that given by Mr. Stevenson in 'The Zoologist' for 1880, p. 326, which is equally interesting.

	Dec. 11	Dec. 12	Dec. 13	Dec. 14	Dec. 15	Dec. 16	Jack-Snipes (not separated.)
Snipe	47	40	120	43	60	310	
Jack-Snipe.....	17	12	20	—	—	—	
Lapwing.....	14	6	—	6	12	20	
Golden Plover ...	10	1	—	—	4	3	
Coot	—	13	40	—	6	20	
Moor-hen	—	—	—	—	9	10	
Water-Rail.....	—	—	—	—	3	—	
Spotted Crake ...	—	—	2	—	—	—	
Heron.....	—	—	—	—	1	1	
Goosander	—	—	—	—	—	1	
Mallard	4	4	14	—	30	32	
Wigeon	5	5	9	4	14	35	
Pochard	—	—	1	—	7	15	
Teal.....	—	—	—	—	1	3	
Golden-Eye	—	—	—	—	—	3	
Tufted Duck	—	—	—	—	—	17	
Shoveler	—	1	—	—	3	—	
Woodcock	—	—	8	—	1	—	
Curlew	—	—	—	—	1	1	
Dunlin	23	—	40	60	179	336	
Dabchick	—	—	—	—	—	6	

Again, writing on the 16th, Mr. Patterson says:—“To-day’s [Yarmouth] market reminded me of the old-fashioned times. There was scarcely a stall without its odd Lapwing, or its bunch of Starlings or Blackbirds. There were scores of Redwings, Fieldfares, and Thrushes; one person had a bunch of Sparrows, and another of Greenfinches. . . . On one stall, with the Scaup I sent you (the “white-nosed day-fowl” of our old gunners), were a half-score Pochards. Last night guns were banging on Breydon Broad all night. Dunlins smothered the flats, I am told. One old lady had a Shoveler. There were two Long-eared Owls up to-day, two Stock-Doves, and some very juvenile Wood-Pigeons. This morning some Coots were swimming about in the lower river, and boys were stoning them. Seven [Whooper?] Swans have been seen on Breydon.”

Similar accounts were received from Mr. Dye, who mentions that numbers of wildfowl passed over Yarmouth going south, and that the cries of Golden Plover were heard at night, as is often the case when they are attracted by the street-lamps.

The rainfall for the year, as taken in my garden, was 24·43, the dryest months being June (1·20) and August (·37); while the wettest, July (3·38), was almost entirely owing to one tremendous downpour on July 23rd. In 1898 the rainfall at Keswick was 23·45, both years being below the average; and our wells, which have been quite dry, still want water.

As it is sometimes convenient to know afterwards what specimens were examined by the recorder, a dagger (†) in the following notes indicate such as were so inspected.

JANUARY.

1st.—A few Golden Plover at the poulters. A Shag † allowed itself to be captured while fishing in Blakenny cut, and, though exhibiting no apparent injury, did not live many days; it had strength, however, to chase and kill some Goldfish in a pond. Although in adult winter plumage it already had a few of the glossy spring feathers showing in places. Four Shags were recorded in last year’s “Notes,” and they certainly are not the rarity in Norfolk they used to be; it would be interesting to know to what British colony we are indebted for them, as they

no longer breed in Yorkshire, and may perhaps come to us from Norway.

14th.—A young male Iceland Gull on Breydon, so tame that Mr. Patterson crept to within ten paces ; and of course next day it found its way to Mr. Lowne's shop. Length, 21·5 ; culmen, 1·3 ; tarsus, 1·8. I have not seen it, but these measurements are sufficient to establish its identity ; and it is the fifth for our county, the Glaucous Gull being much commoner.

18th.—One of the chestnut-coloured Partridges killed at Bylaugh, near Dereham, by Col. Custance. These birds are quite different in colour from the melanistic race which was met with at Campsea Ash in 1891 and 1892, with which they cannot be confounded. They are simply an erythrism, an abnormal replacement of the natural colour by red, as has occasionally happened in the Bullfinch, House-Sparrow, Green Woodpecker, Rose-coloured Pastor, &c. This month a variety of the Hooded Crow speckled with white was taken near Thetford.

19th.—Black-throated Diver shot at the mouth of the river Bure by Mr. E. C. Saunders, who describes it as largely spotted on the wings, and becoming barred with white on its back.

26th.—A hundred Tufted Ducks and several small lots of Gadwall and Wigeon seen on the Ouse near Thetford (T. Southwell). Many Wild Ducks already paired.

31st.—Thousands of Lapwings at Hickling (S. Harmer).

FEBRUARY.

1st.—A flock of about fifty Siskins by our river searching the alders in their usual engaging way.

2nd.—Mr. Caton Haigh met with seven Shore-Larks at Cley, soon after with a flock of about thirty, and farther along the coast saw other small parties and single birds ; also twenty Chaffinches on the shingle, which he presumed had just come over, though we do not expect them after Christmas.

9th.—Coots and Redshanks paired (Bird).

11th.—The weather is now extraordinarily mild for the time of year, and the large flights of Wood-Pigeons which were in all our woods in January have gone, probably northwards. Lambs are becoming general, and the young wheat, which is two inches above the ground, is about safe from the depredations of Rooks,

which have an appetite for the kernel long after it has sprouted. Seed-corn must be drilled very deep to be safe from their long beaks, on account of which and other misdeeds very few Norfolk farmers give the Rook a good character. Assisted by the Jack-daws—an increasing species in the eastern counties—the rascals have also, in spite of shooting, been doing their best to let "the weather" into the farmers' barley-stacks by persistently pulling out great quantities of the top straw and much of the thatch for the sake of the grain underneath, which they contrive to do with the greatest skill, but more easily where a stack is made up of short rakings. Two or three defunct Rooks hoisted on sticks make a fairly efficient scarecrow, but occasionally a very hungry Rook will not be deterred from making a regular burrow into a stack, protruding from which may be seen the black tip of his tail. More than this, Rooks will actually attack the roof of a barn, which must be pure mischief, as there can be nothing to eat there, except it be a few grubs in the thatch. Everyone knows their unfortunate partiality for swede-turnips at this time of the year, and that in itself is a strong indictment against large Rookeries. By pecking holes they soon make the roots rot; and in such a winter as 1898-9 this is no joke. But perhaps what most annoys the farmer is to see Rooks on a turnip-field when the plant is just coming up, for, although in some cases the birds are after the wireworm, the result is the same;—a crop of barren spaces appear in the field instead of swedes and mangolds, just as if a portion of the field had not been sown at all. Mr. Holmes informs me that at Winfarthing, Rooks have for some years nested on nut-bushes, where they will not be safe from the enraged Norfolk farmer, who seldom has a good word for these sable thieves.

14th.—Two Ruffs,† just commencing the spring change, shot in a field of young wheat with some Lapwings at Postwick (W. Spelman), which occurrence so very early in the year must have been due to the open weather. Plovers at this season are very fond of young wheat, and there have been a great many on the uplands, and in this instance their presence no doubt acted as a decoy to the Ruffs. Weather wet, but days very fine in spite of it.

23rd.—A pair of Shoveler Ducks on our largest broad (Bird).

The repeated occurrence of Shovelers in the winter has been already remarked. Mr. Southwell thinks they are increasing in summer, and certainly the number of egg-shells in a nest testify to their prolificacy. Of the seven Ducks which commonly breed in Norfolk, the Garganey Teal is the only one which is never seen in winter; yet Norfolk is far from being its northern breeding limit. I have seen as many as nine eggs in a Garganey Teal's nest, and eleven in a Shoveler's.

27th.—A very early Thrush's nest at Keswick with three eggs, and another nest with one—undersized eggs in both cases; and a Robin's nest quite ready, in spite of slight frosts every night sufficient to brown the wheat. A Wild Duck reported to be already sitting at Shottesham, many Siskins in our "Rookery," and a Redpoll apparently searching for a nesting-place; Rooks also examining trees, and quantities of Thrushes on the fields. Partridges and Wood-Pigeons proved the unprecedented mildness of the weather by being paired long ago, although there was snow not far away. Five Shovelers at Hickling (Bird); not safe from the gunners yet.

MARCH.

My correspondent, Mr. Bird, writes from the Broads:—"An old male Golden-Eye still about, four pairs of Bearded Tits (good news), one Coot's nest half-built, and two others commenced; Water-Rails very noisy all day." Four days later came the snowstorm which wrought such destruction among the Lapwings in Scotland (*Zool.* 1899, p. 225). At once all work on my farm was stopped, and the wretched Thrushes, some of which had only just come northwards, crowded on to the few bits of grass still uncovered by the snow. In spite of this the Wheatear appeared at Beachamwell on the 22nd (R. C. Nightingale), a day later than Mr. Haigh first saw it in Lincolnshire.

23rd.—Mr. Bird found a Long-eared Owl sitting on five eggs among some brakes, which was remarkable after such a downfall of sleet and snow, much of which was still on the ground, and also from the circumstance of the nest being on the ground, the nests of this species which I have seen having always been in a tree, the silver-fir by preference.

28th.—Two Bramblings with black chins recently taken at Yarmouth; Mr. Lowne, who kept one of them, found that the

amount of black diminished in the moult; these black-chinned Bramblings are not a very uncommon variety, and are the exact reverse of the white-chinned Goldfinch, which is sometimes called a "cheverel," and was described by Madarász as *Carduelis albogularis*. The black-chinned Brambling does not seem to have yet received a name in science.

APRIL.

4th.—A pair of Garganey Teal seen (A. Nudd). Now uncommon anywhere, and practically extinct in West Norfolk.

8th.—Another pair of Garganey (Bird), evidently going to nest, if they had not already begun on a rush-tuft.

11th.—A Sheldrake seen on Saham Mere, which is twenty-four miles from the sea (A. W. Partridge).

12th.—First Ruff; three Water-Rails' nests (Bird).

16th.—Hoopoe at Morston (R. Wood). Two Spoonbills on Breydon (B. Dye).

18th.—A few Gadwall, and one Tufted Duck only at the meres on Wretham Heath, where, owing to the drought, there is very little water (T. Southwell).

19th.—First Grasshopper Warblers heard (Bird).

MAY.

3rd.—Mr. Patterson saw an Iceland Gull being mobbed by other Gulls at Breydon "Knowle." Thirteen Whimbrel at Hickling; and immediately afterwards two Garganeys (Bird).

8th.—Six or seven Spoonbills to be seen on Breydon muds, where they allowed themselves to be viewed by several people; and again, a few days afterwards, by Mr. Patterson and Mr. Dye, with the Iceland [or Glaucous] Gull mentioned above; and nineteen Bar-tailed Godwits. These are the same Spoonbills alluded to by Mr. Farman (Zool. 1899, p. 366), and three of them afterwards moved on to Cley (Pashley); while the Gull moved its quarters to Horsey Broad, where it was seen by Mr. Bird. Mr. Patterson has already described the manner in which these Spoonbills walked (Zool. 1899, p. 270); and, again, it was his opinion that Spoonbills are incapable of uttering any sound. I was quite of the same opinion until a short time ago, when two Spoonbills in confinement, which had been dumb for a long time, suddenly, under the

influence of a warm day, began a rather feeble duet, accompanied by an up and down movement of the neck, but sufficient to prove them not speechless.

9th.—A Pied Chaffinch at Northrepps.

10th.—Four Pied Flycatchers in Mr. Pashley's garden.

11th.—A Marsh-Harrier's nest† quite ready for eggs, but not containing any, found about two miles from the sea by a naturalist who saw the female rise and quit it at twenty yards, there being four other Harriers on the wing at the same time, a sight not often enjoyed in England nowadays. Unfortunately the two old Harriers brought themselves under the gamekeeper's fatal ban by killing some leverets, and their identity, which had been questioned, was only too well established shortly afterwards, as this obnoxious individual trapped them both. The cock was quite the finest old male that has been seen in Norfolk for many a year, with grey wing-coverts, and a light tail and crown. The Marsh-Harrier's nest was nine inches in diameter and raised fourteen from the ground, but, as Mr. Bird remarked, as the rushes grew the nest would naturally continue to rise a little with them. It was composed of pieces of the "gladden" which grows all round (*Carex* or *Juncus*), and a few dead hemlock stems from the marsh wall, with one large bramble, and a bit of rotten wood the thickness of a man's finger. A few yards off lay the remains of a small leveret, the fatal appetite for which had brought down the keeper's wrath. The marsh is what would be called here a dry marsh, of large extent, a capital place at this time of the year for Swallow-tailed Butterflies and Cuckoos, one of which birds was seen by the marshman with an egg in its mouth or else a young bird. Of this nest Mr. Kearton obtained a good photograph, which is excellently reproduced in 'Our Rarer British Breeding Birds.' It is supposed to be twenty years since any Marsh Harriers have been hatched off in Norfolk, the last attempt, known to Mr. Bird, prior to this, being in 1894, when two eggs are believed to have been laid and two Bantam's eggs substituted for them, on which Mr. Bird ascertained the old female Harrier sat. Probably she shared the usual fate of all "Hawks" in a game-preserving county long before she had time to find out the ruse which was practised upon her. Mr. Stevenson considered that the Marsh

Harrier nested at Ranworth Broad in 1878; and in May, 1881, I saw one at Barton, which, from its tameness and the time of the year, I supposed might be nesting. The boldness of the Tawny Owl when it has young is well known, and one which had a nest in an old tree at Buckenham maintained this savage character, and frightened so many people that it had to be got rid of. First a signalman received a buffet, and lost his hat; then the rector of the parish was attacked; after this a man named George lost his hat, which was picked up in a field some distance away. A young lady was next attacked; and another person had to act on the defensive against this formidable aggressor three times, the Owl seeming determined to fight him somehow. It is extraordinary that the Tawny Owl still holds its own in small numbers in this county in spite of the systematic persecution it receives. I have lost two of my Teal; but am glad to say the Owls remain unmolested. I have never heard of either the Short-eared or the Long-eared Owl showing such boldness in the defence of their young; but there are few more savage birds than the Eagle Owl in confinement at such times; and some years ago my man was near losing his eye, since when I have had a basket helmet made for him. For a week in the early part of May a Nutcracker frequented a plantation of tall dark fir trees near Thetford, Mr. Thomas Baring's attention being first drawn by its unusual croaking note; but after a week the bird disappeared, and was not seen again, fortunately escaping the prowling gunners. The last occurred in 1888; but we have never had one in the spring before, and only four altogether; and, for Lincolnshire, Mr. Cordeaux only mentions two.

12th.—My nephew saw a Cuckoo fly past him in Northrepps Avenue with what he distinctly perceived to be an egg in its mouth, and close to where I had seen one searching for a nest two days before. It is not often one has an opportunity of verifying the habit now so well known.

13th.—Mr. Pashley saw a Black Redstart. A pair of Common Redstarts have built in a tub put up for Owls at a considerable height from the ground.

16th.—A pair of Bearded Tits on the same pond near Holt where three were recorded last September, and where the reeds have been allowed to grow up, which no doubt attracts them, as

they were again seen there in December. Two or three were also lately noticed by Mr. Buxton in a small "bay" on the north side of Fritton lake, where it was believed they were extinct (*cf.* Norwich N. Tr. vi. p. 436). A nest, found by Mr. Bird, on the 1st, contained eight eggs on the 6th, a large clutch, six being the usual complement. Very few eggs are taken now, there being a general desire on all hands to protect this charming bird before it is too late.

24th.—Four or five Gadwall on Scoulton Mere, evidently nesting; and about one thousand Black-headed Gulls; but no Black Terns there this year. One Gadwall was feeding in the water, as if she had left her nest and was hungry; while the drake kept guard over his consort until the boat was within thirty yards of her. I never identified Gadwall on Scoulton Mere before; but the keeper says they have been there all the winter; so perhaps these birds' limited area is spreading. I also received some from a small lake at Watton, where they do not breed, but regularly appear as visitors. They are tolerably common in West Norfolk, probably more than a hundred pair of them; and fifteen years ago there were even more, but never fifteen hundred on one property as has been said. They have never been known to nest on the Broads.

25th.—Lesser Spotted Woodpecker's nest, with three eggs, at Spixworth; and another nest at Rollesby (Cole); this bird probably also bred at Frammingham Earl.

30th.—Lesser Redpoll's nest at Ingham; about two hundred nests of the Black-headed Gull at Somerton Broad; and a pair of Garganey at Horsey (Bird). An Aylesbury Duck, belonging to Mrs. Blythe, has laid an egg measuring eleven and a quarter inches in circumference; a monstrosity indeed!

JUNE.

3rd.—A Little Bittern at Hickling (Bird).

7th.—Two pairs of Norfolk Plovers,† probably nesting. One had a very yellow bill, and from its general tameness and running in front of us, must, we thought, have young; but a careful search failed to find them. Mr. Norgate tells me that the Ringed Plover will occasionally lay to the eggs of this species; and at Harling both are common, proprietors for the most part protecting them.

15th.—Grey Plover at Breydon (Patterson); a late bird to be still here in June.

20th.—A Greater Spotted Woodpecker's nest† in an alder tree, containing young ready to fly, and close to a house near Keswick. There may also have been a nest at Northrepps, as a female, accidentally trapped, had the bare belly spot.

29th.—A mealy Hedge Sparrow reported seen at Keswick; and a white one at Mousehold.

JULY.

2nd.—Six Curlews at Keswick.

25th.—A very early Greenshank on Breydon muds (Patterson); and about the same time a Golden Plover at Waxham (Bird).

31st.—A fine Demoiselle Crane (*Grus virgo*), with two primary quills severed, shot at Brancaster, by the sea (R. Clarke); but, from enquiries made by the Rev. J. Tuck, it is possible that this, as well as three others shot at Lavenham, in Suffolk, had been turned out by the Duke of Bedford's orders at Woburn Park. Another, with a portion of the carpal joint cut away, was sent to Mr. Cole, of Norwich, on October 6th; and altogether twenty are reported to have got away from Woburn in spite of several being pinioned to the first joint.

AUGUST.

2nd.—Two Wood-Sandpipers at Hickling (Bird), a species which generally comes—true to date—at the beginning of harvest; but no Garganeys, though looked for; though Mr. Bird hears that a keeper has some young ones hatched from gathered eggs.

9th.—Five Wood-Sandpipers seen in a marsh at Cley (F. D. Power); also a small Wader, which the authorities there, who are now very clever in detecting novelties, considered to be a Broad-billed Sandpiper (Pashley).

18th.—Two Corncrakes, flushed by my nephew in a barley field, did a very unusual thing in immediately perching on some elm-trees. Later in the autumn two were "telegraphed" at Keswick; and I heard of two caught by hand elsewhere. Mr. Bird remarks that it has been quite a Landrail year, in confirmation of which he sends me dates of seventeen shot or seen by

himself between August 25th and October 10th, adding that he had heard of many others; and several were seen at Northrepps about that time.

29th.—W. A Green Woodpecker seen on the sea-wall at Cley by Mr. F. D. Power, not the first indication we have of this being an over-sea migrant; for, as Mr. Pashley reminds me, they are often seen on the brackish marshes, and he has himself flushed them from the creeks by the beach. Mr. Bird remarks that if Green Woodpeckers do not migrate they move about much more in Norfolk in autumn and winter than in spring and summer; and between September 2nd and November 29th he saw nine, all within four miles of the coast, and in places where they certainly do not breed. They are, however, like the Lesser Spotted Woodpecker, very susceptible to frost, which means starvation for them. At the beginning of the year Mr. Lowne had a Green Woodpecker with a beak like a Crossbill, and not only was it crossed, but the longest mandible had attained the length of two and a half inches, and it is extraordinary how it maintained its existence.

31st.—S.S.W. Five Great Skuas seen on the coast by Mr. Long; and one of them, again, a few days afterwards, by Mr. Gunn. October is the usual month in which this fine Skua has visited Norfolk, and only one has been seen before in August. Mr. Connop has a splendid melanism of this species, quite equal to the one figured in Dresser's 'Birds of Europe.'

SEPTEMBER.

Wind west, thirteen days; wind north, twelve days; wind south, two days; wind east, two days.

4th.—W., light. A hybrid† between a Goldfinch and a Linnet, netted at Acle by a birdeatcher named George, has the wings of a Goldfinch, but the Linnet's plumage predominates in the breast, back, throat, and tail, and its note partakes of both (W. Lowne). It is a hybrid which has been several times bred in confinement, but the present one we are assured is a wild caught bird, and agrees fairly with the description in Macpherson's "Hybrid Finches" (Norw. N. Tr. iv. p. 368).

5th.—N.W., first frost. An immature Icterine Warbler† (*Hypolais icterina*)—the fourth that has been taken in Norfolk—

shot on our coast by Mr. E. C. Arnold (Zool., 1899, p. 475), is exactly similar in size and tint to one shot in 1896 by Mr. Robert Gurney, and presented to the museum. Mr. Cordeaux, in his List, is only able to give one Lincolnshire occurrence of this species, and two of the Great Reed Warbler, which Mr. Howard Saunders thinks may be also added to the Norfolk list (Manual B. B., 1st ed.).

6th.—W.S.W. A Manx Shearwater picked up at St. Faith's, a species which always turns up at this time of the year, either off the coast or inland.

7th.—E. A young female Wheatear, shot by Mr. F. E. Gunn on the coast, has the central rectrices black to the base, and the other rectrices also much smudged with black, and some speckling of the same on the belly; at first thought to be an Isabelline Wheatear, but it seems rather to be a slightly melanistic *Saxicola oenanthe*.

8th.—W. A beautiful young male Buff-breasted Sandpiper (*Tryngites rufescens*), shot on shingle at Cley by Mr. Arnold. Its nicely mottled upper parts are very different from the dark back of our old Museum specimen, said to have been shot in July, a few miles east of where the present one was procured. The species has a more rounded head than most of its kin, which feature was well shown in Mr. Arnold's freshly mounted example, and also the distinctive freckles under the wing. Mr. Cordeaux does not include this American species in his List, but it has been shot five times in Norfolk. Whether the present example came with a west, or an east wind, seems doubtful.

9th.—N.W. Two Velvet Scoters seen, several Richardson's Skuas; also Great Crested Grebes, young Ruffs, two Dusky Redshanks, and a Red-necked Phalarope,—all on the coast (Pashley).

14th.—N.E. Great Snipe at Southwold ('The Field'). Between this date and the 27th Great Snipes were shot at Yarmouth (Dye), Haddiscoe, Pensthorpe (Davey), and two at Ellingham (Toysen); while later on at Stuston (Southwell), and two at Morston (Pashley). It is many years since Norfolk has had any number of Solitary Snipe, though there were several in September, 1880.

18th.—N.W. Hoopoe at Skeyton (Cole).

21st.—N.W. Four Cormorants at Hunstanton (Tuck).

29th.—Another of the chestnut Partridges,† an adult of a dark Grouse-like colour, killed at Elsing (T. E. Gunn), which is near where the others have all been taken, and where a race has really been perpetuated, this being the fourth year in which they have turned up, and the present the twelfth example. It would be interesting to see what a young one, about half-grown, would be like, as no doubt the dark plumage would show. As so much has been said in these "Notes" about this singular variety, the accompanying reproduction of a sketch by Mr. Herd may be acceptable (Plate II.), representing one of our best specimens (killed last November), a typical *Perdix montana*, Briss.; and very like Brisson's plate, with just the same light head and neck. Even in his time it was known to cross with the Common Partridge, from which the French ornithologists supposed it to be distinct.

30th.—S. The bushes by the sea full of small birds, including a Nightingale and some Pied Flycatchers, the wind, which had been westerly, having suddenly veered round to S.E. (Pashley). A good many Sky-Larks were found dead under the telephone-wires at Cley (Pashley), and a Dunlin was shot in a turnip-field at Trimmingham (Buxton); but this was before the movement noticed by Mr. Haigh in Lincolnshire.

OCTOBER.

Wind west, ten days; south, eight days; north, six days; east, four days.

1st.—S. veering to S.S.E. Hundreds of Long-tailed Tits seen in St. George's Park, Yarmouth, by Mr. Patterson; but the true *Acredula caudata* was not detected among them, though, according to the late Mr. Churchill Babington, it has been met with in Norfolk. It seems to have been a great Tit year, as Mr. Bligh counted twenty-seven Long-tailed Tits in one flock in August, and I noticed several. Mr. Caton Haigh reports that it is many autumns since he noticed so many Great and Blue Tits in Lincolnshire. 1882 was also a Tit year in Norfolk, and in October, 1880, there were troops of them near Cromer—distinguishable by the white on the head being restricted to the crown—which had presumably crossed the sea. Great Tits have been taken at Norfolk light-vessels several times, but the Long-tailed Tit only once. About this time four Grey Phalaropes were

announced in different places (Lowne and Clark), and an Eagle, doubtless a young White-tailed Eagle, was shot at Babingley, near Lynn. This is the seventh Eagle in the last twelve years, the others occurring in November or December.

2nd.—S.W. Thirty-three Grey Plovers on Mr. Durrant's stall in Yarmouth Market (the dealer alluded to in the preface), and three Greenshanks (Patterson).

12th.—S.S.W. One hundred and twenty Grey Plovers offered by different Breydon gunners to Mr. Durrant, the salesman, who says that during the ten days the migration lasted he had about two hundred and seventy altogether (Patterson). The wind had been west or some point of west every day except on the 6th, 8th, and 9th, and in the face of a west wind they came, which was very strong on the 3rd, when perhaps most of them touched shore. A good many came to Cley and Blakenny (Pashley), and Mr. Haigh fell in with them as far north as Lincolnshire. This year has produced a greater number of Grey Plovers than has occurred since the autumn of 1877; but they are at all times rather a common Norfolk bird, and I have always considered them essentially a bird of the coast, and at Blakenny much more abundant than the Golden Plover.

16th.—S.E., strong. Mr. Bird, who lives near the coast, put up three Snipe in a dry turnip-field, and at the same time remarked Rooks, Grey Crows, and Jackdaws streaming overhead; while flocks of Grey Crows were to be seen passing Fritton Lake, indicating that the movement had an extended front. I saw a Ring-Ouzel, and "very many Ring-Ouzels" turned up at Cley (Pashley). Four days after that, flock after flock of Long-tailed Tits arrived, and I am assured by Mr. Pashley, whose "garden was full of them," that they were actually seen coming off the sea (*cf.* note on Oct. 1st).

25th.—N.N.W. Mr. Lowne received an immature female Purple Heron from Blyth, near Lowestoft, where it was shot by Mr. Roberts, as notified in the 'Field,' and may possibly have been the bird which was seen at Easton Broad on the 18th, and thought to be a Glossy Ibis ('Field,' Oct. 28th). The last occurrence was in 1882, and, like nearly all the others, an immature example. The wind on the 24th was N.N.E.; Grey Crows going N.W. On the 23rd and 22nd there was practically no wind.

NOVEMBER.

8th.—S. A gamekeeper named Platten, about six o'clock in the evening, shot a large bird which he noticed pass twice under the arch of Rollesby Bridge, where there is a small stream about four inches deep. When taken to Mr. Connop it proved to be an adult Night-Heron † without any occipital plumes, and in somewhat rusty plumage, and was no doubt after fish. It is supposed to have been some days on the broad when shot. Curiously enough, Nov. 8th is exactly the same day on which one was shot at Caister in 1860. It is twelve years since there has been a capture of the Night Heron, the two seen at Beeston being doubtful; and the last two were shot respectively on the sail of a mill and the roof of a house.

11th.—A Shag caught on the beach (Patterson), but it may have been shot at.

15th.—Two Egyptian Geese shot at Morston (Pashley), almost the only Geese killed this winter, except two Pink-footed, which were winged (Pashley), of which one got well and escaped; but the other is in a garden where there are some Bean Geese, with which it will possibly pair.

17th.—Mr. Pashley writes that flocks of Little Auks were seen passing at sea, and that two of them came near enough to strike the rigging of a steamer which a short time before had come ashore. No more than I know of were captured; and, as I was away, I did not note the direction of the wind, but it was immediately after the great meteoric shower. Two were also picked up in October.

DECEMBER.

8th.—Received from Saham a drake Shoveler † beginning to assume plumage, caught there on the 6th, and a few days afterwards one was taken at Yarmouth (Patterson).

9th.—Received a Storm Petrel † from Winterton Lighthouse, which, I believe, was found on the shore with three Gannets and some Kittiwake Gulls (Patterson).

21st.—Three Barnacle-Geese shot out of a flock of ten at Breydon (Patterson), and about the same time three at Morston and two at Cley (Pashley), where altogether fifteen were seen. The last I remember in that district was a single bird shot from

the shore in October, 1890, and so many as fifteen is quite unusual on any part of the east coast.

AVICULTURAL NOTES.

Black-tailed Godwit.—Two pairs of Black-tailed Godwits from Leadenhall Market, turned into an open-air cage in May, soon became tame enough to be amusing, and, being pinioned, were allowed their run every day. No matter how dry the grass was these Godwits were continually boring for worms, but it is difficult to see when they get anything, the action of swallowing is so quick. They frequently stood on one leg, sometimes scratching themselves with the other; sometimes motionless, and in that attitude appeared to sleep. They did not care for water so long as they had sopped bread and finely chopped meat, which they eat voraciously. Very vociferous over this food, it was most comical to see them sparring like Ruffs, seizing one another by the beak, and screaming with rage if one was thought to get more than its share, which the females generally did. But the prettiest action (when I longed to photograph them) was when, with spread tail, lowered head, and scapular feathers raised, and the beak used as a weapon, they menaced one another; but no harm ever came of it. One lived eight months, but the cold was too much, and they are evidently not such hardy cage-birds as the Knots, which stand frost well. After three months' diligent boring they concluded there were no more worms in my enclosed garden, and gave up boring, and never tried again, thus showing an amount of instinct very near to reason.

Common Crossbill.—The following are a few experiences with caged Crossbills, which, unlike the shy Hawfinch, feed fearlessly in the presence of anybody, and are consequently amusing to keep and easy to watch. Restless and Parrot-like in action, they climb about the wires of a large cage, never tired of testing its strength and durability with their strong jaws. Cones are their natural food, and they most dexterously push aside the scales by a sideways lever-like motion of the mandibles in order to get at the seed beneath, first bringing the points of the upper and lower mandibles from their crossed position to be almost over each other, an action which requires to be seen to be duly appreciated.

In this way they prise off the scales, but unless there be a seed they know too well to do it in useless search. It may be presumed that they would generally push the scales of a cone to the right or the left, according to the way their mandibles cross one another. In fifteen recently examined the upper mandible turned to the right, and in eight to the left. In one I had alive the mandibles grew to the unnatural length of an inch. My Crossbills never manifested any interest in old brown fir-cones, but they liked the new ones in September, and were very fond of the big cones of *Picea nobilis*. We read of great destruction caused by them to apple crops, but they do not seem able to work their way into an apple which is not on a bough, though they relish it if cut into small pieces, evidently liking the fruit part quite as much as the pips. Their power of sudden concealment in the tops of the fir trees, remarkable at first sight, is entirely due to their instinct in remaining quite still. A Crossbill can fly with a fir-cone in its mouth, which is one proof of the strength of those powerful mandibles, if, indeed, proof were wanted. My Crossbills favoured me with no music until Christmas Day, when for the first time one of them was heard to utter a loud chirp. When bought on July 6th they were in red male plumage; by Christmas Day one of them had become quite yellow, but the other two cocks had changed but little, though the brightness of their red had diminished since October. Bechstein says many are bred in aviaries in Thuringia, but never acquire the red colour in confinement.

Erratum in Notes for 1898.—I learn from Mr. Howard Bunn that the correct date when the Little Bustard was shot at Kessingland, as recorded in last year's "Notes," was not May 30th, but May 3rd, 1898, an error on my part.

BIOLOGICAL SUGGESTIONS.

MIMICRY.

By W. L. DISTANT.

(Concluded from vol. iii. p. 553.)

ACTIVE MIMICRY naturally predicates intelligence, and is not equivalent to what is generally described as instinct,* so universally applied to any other animal than man. Prof. Lloyd Morgan remarks on the many who believe that instinct is neither more nor less than inherited habit, but concludes that, "while still believing that there is some connection between habit and instinct, admit that the connection is indirect and permissive rather than direct and transmissive."† Every attempt is made to minimise this faculty. In birds, Mr. Orr has warned us not to overrate the intelligence implied by nest-building "of an animal which has not sufficient intelligence to loosen a slip-knot tied around its leg."‡ But man himself has very slowly and laboriously acquired—and has not yet altogether the desire to possess—the intelligence to loosen the artificial slip-knots that bind him to many errors and much superstition. If, however, some would minimise animal intelligence, there are others who maintain the purposive acts of plants. Thus Mr. Grant Allen, in describing the wonderful life-history of the common gorse, and allowing that "the intelligence is here no doubt unconscious and inherited," still remarks: "Gorse, in short, may fairly be called a clever and successful plant, just as the Bee may be called a clever and successful insect, because it works out its own way through life with such conspicuous wisdom."§ The

* The true teleological definition of the term was defined by Paley: "An instinct is a propensity, prior to experience, and independent of instruction" ('Natural Theology').

† 'Habit and Instinct,' p. 322.

‡ 'A Theory of Development and Heredity,' p. 19.

§ 'Flashlights on Nature,' pp. 282-3.

same spirit runs throughout Dr. J. E. Taylor's 'Sagacity and Morality of Plants.'

Animal intelligence has been opposed by two great factors—the philosophy of Descartes * and theological dogma. The first

* In discussing a philosophy like that of Descartes one must not trust alone to his own impressions and reading of the philosopher, or a critic may soon be found to prove that either he has not such an intimate acquaintance with the language in which it was written as to prevent misunderstanding, or that his mind is not sufficiently attuned to escape misconception. I will therefore quote some authorities to whom these objections do not, or should not, apply. According to Dr. Martineau, Descartes taught that "the soul, *i.e.* the thinking principle, though united with the whole body, exercises its chief functions in the brain." "But the soul he pronounced to be exclusively human, and, in the human being, a substance entirely distinct from the body." Hence animals are automata. "All the things that you make Dogs or Horses or Monkeys do are only movements of their fear, their hope, or their joy, which can be made without any thought" ('Types of Ethical Theory,' 2nd edit. vol. i. pp. 141, 144, 145).—Prof. Mahaffy, describing Descartes' opinion on the point, and in respect to the supposition that other animals, from the likeness of their organs to ours, may have some thought, though less perfect than our own, makes him, in rejoinder, to say:—"To this I have nothing to reply, except that, if they thought as we do, they must have an immortal soul, which is not likely, as we have no reason to extend it to some animals without extending it to all, such as Worms, Oysters, Sponges, &c." Thus, as Prof. Mahaffy further remarks:—"The difficulty which the opponents of Descartes felt most strongly was the possible extension of souls to Oysters and Worms. Thus theological questions determined the questions on both sides" ('Descartes,' pp. 180 and 182). It is a relief to turn to Renan, who describes Francis of Assisi as "far removed from the brutality of the false spiritualism of the Cartesians; he only acknowledged one sort of life; he recognized degrees in the scale of being, but no sudden interruption; like the sages of India, he could not admit that false classification which places man on one side, and, on the other, those thousand forms of life of which we only see the outside, and in which, though our eyes detect only uniformity, there may lie infinite diversity. For Francis, nature had but one voice" ('Studies in Religious History,' p. 313).

Even Weismann may be considered no supporter of the view of animal intelligence, judging from the following remarks:—"It is usually considered that the origin and variation of instincts are also dependent upon the exercise of certain groups of muscles and nerves during a single life-time, and that the gradual improvement which is thus caused by practice is accumulated by hereditary transmission. I believe that this is an entirely erroneous view, and I hold that all instinct is entirely due to the operation of natural selection, and has its foundation, not upon inherited experiences, but upon the variations of the germ" ('Lectures on Heredity,' &c., Eng. transl., 2nd edit. vol. i. p. 92).

is clearly intelligible and ably stated ; the second is more of an implication, but both are based on the belief of man's special immortality ; and, although divines are found* who are willing to extend the promise of a future life to the whole animal kingdom, and have discovered texts to advocate that view, the Hebrew Scriptures can scarcely be said to strongly support it. Even the poor untutored Todas of India, who are alone valued as an ethnological study, have at least a kinder and more sympathetic heart for their cattle. The sum of their belief is, that they were born—they and their cattle somehow rose out of the earth. When they die they go to Amnôr (the next world), which is a world exactly like this, whither their Buffaloes join them, to supply milk as in this state.† Sir Herbert Maxwell, in discussing our obligations to wild animals, states, as a "remarkable and perplexing fact, that neither the chosen people nor Christians are bound by their religion to pay the slightest regard to the feelings of animals. . . . There is not a word about mercy towards dumb animals in the Sermon on the Mount; not a word in all the writings of the Fathers (so far as known to me); not a word, apparently, from all the teachers of Christianity until we reach the dawn of rationalism in the eighteenth century, when an English country clergyman—the Rev. Mr. Grainger—scandalized his congregation and jeopardized his reputation for orthodoxy by preaching the duty of humane treatment of beasts and birds."‡ But if evolution is not a farce, and man has been derived from more lowly ancestors, then the possession of a soul—using the

* "Bishop Butler urges that every argument by which we maintain the immortality of man is of equal validity to maintain the immortality of the lower animals" (Canon Wilberforce).

† W. E. Marshall, 'A Phrenologist among the Todas,' p. 125.—It is a long flight from a Toda to an Agassiz, but we may quote the opinion of that eminent and not undevout zoologist :—"Most of the arguments of philosophy in favour of the immortality of man apply equally to the permanency of this principle in other living beings. May I not add that a future life in which man would be deprived of that great source of enjoyment and intellectual and moral improvement which result from the contemplation of the harmonies of the organic world would involve a lamentable loss; and may we not look to a spiritual concert of the combined worlds and all their inhabitants in presence of their Creator as the highest conception of paradise?" ('An Essay on Classification,' p. 99).

‡ 'Blackwood's Magazine,' August, 1899, p. 228.

term in the ordinary signification as taught to ordinary people—must imply either its existence in the whole animal world, or its gradual evolution* with the specialization of type, both of which premises are outside scientific reasoning, and therefore quite beyond the cognizance of plain folk. To deny conscious intelligence is a corollary to denying immortality to animals, and it is often the desire to monopolise the last that so frequently ensures the denial of the first.† The writer of 'Ecclesiastes' had nursed the thought—"Who knoweth the spirit of man whether it goeth upward, and the spirit of the beast whether it goeth downward to the earth."

That animal intelligence is sufficient to prove much mimicry of an active and not of a merely passive character, is abundantly advocated by facts. That an insect or bird should seek and obtain concealment by its own volition, and by a sense of adaptation in bringing into juxtaposition its own peculiarly-coloured body with some material object with which it closely assimilates, is an exemplification of intellect, though inferior to that shown in the general psychology of Bees, Wasps, and Ants. In Birds it would rank lower than the acquired and more complicated knowledge of the African Honey-bird, which is able to associate the appearance of Man with that of a honey-seeking creature, and to lure and lead him to the nest of the Bee, in order that his assistance and strength may wreck the nest and leave the bird

* "I believe that the spirit of man *was* developed out of the *anima* or conscious principle of animals, and that this, again, was developed out of the lower forms of life-force, and that this in its turn out of the chemical and physical forces of nature; and that at a certain stage in this gradual development, *viz.* with man, it *acquired* the property of immortality precisely as it now, in the individual history of each man at a certain stage, acquires the capacity of abstract thought" (Josh. Le Conte, 'Evolution and its Relation to Religious Thought,' p. 295).

† The Hon. L. A. Tollemahe has contributed some original remarks on this subject:—"I sometimes think that the lower animals bear the same sort of relation to man that the Apocrypha bears to the Bible. Theologians are apt to regard the human soul and the Bible as having a right (so to speak), each in its own way, to say 'Noli me tangere' to science. The lower animals and (though in a very different manner) the Apocrypha bar such exorbitant claims. They serve as intermediate links, and thus tend to *evolutionize* Religion. In other words, the lower animals are half-human, just as the Apocrypha is half-Biblical" ('Benjamin Jowett,' p. 37, *note*).

what it requires in the *débris* that remains after the auxiliary's wants are satisfied. "A Green Frog will with predilection rest on green leaves. The advantages of concealment are obvious, and in this case he 'adapts himself' to the surroundings by making for green localities; if he did not he would be eaten up sooner than his more circumspect comrades. But this making for, and sitting in, the green has not *necessarily* made him of that colour."* As Dr. Reid forcibly enquires, "By what term shall we designate the action of the Spider when he builds his web? Does the animal not know for what purpose he constructs it? Was there ever a web-building in which there were not circumstances novel alike to the experience of the individual and to that of the species? Or, when he runs along a thread to capture his prey, or cuts loose a dangerous captive, does he not consciously adapt means to ends, just as much as a man who runs to secure a snared bird, or who builds a 'golden bridge' for a flying enemy?"† What angler does not know the greater difficulty in filling a basket from a stream much fished, than from one little visited by anglers, and how the greater skill required is not an incident of fewer fish, but of the greater caution acquired by the same? The Marquess of Granby truly observes: "Of course, at the date when Canon Kingsley went a-fishing, Trout were easy to catch compared with what they are now, at any rate in the best known English rivers." . . . "Trout, being very much fished over," in many cases from over-weed-cutting, &c., "are highly educated and more difficult to kill than ever they were before."‡ A recent writer has illustrated this fact. Mr. Basil Field, describing his experience in fly-fishing, states:—"If a fly be cast in one of Mr. Andrew's stock-ponds at Guildford, there is a rush and fight for it among all the Trout within whose range of vision it falls. If it be cast again a few minutes after a Trout has been caught and returned to the water, two or three fish only will compete for it. Repeat the process, and perhaps one may come, slowly, shyly, and in a half-hearted manner. But when several have been taken and returned—although the pond is large and crowded with fish—cast the fly where you will, the Trout are shy, suspicious, and

* Haeckel and Gadow, 'The Last Link,' pp. 125-6,

† 'The Present Evolution of Man,' p. 138.

‡ 'The Trout' (Fur, Feather, and Fin Series), pp. 87-8.

hard to catch."* Prof. McIntosh, with reference to the absence of the cortex of the brain in fishes, observes, "Who has proved that the function of memory depends on the brain-cortex of the human subject? I have seen many a curious case in the pathological room, the history of which would not have led us to this conclusion."† According to Livingstone, the Hippopotamuses in the rivers of Londa, where they are much in danger of being shot, gain wit by experience; for while those in the Zambesi put up their heads openly to blow, those referred to keep their noses among water-plants, and breathe so quietly that one would not dream of their existence in the river, except by footprints on the banks."‡ In the Leeba, Crocodiles possess more of the fear of man than in the Leeambye. The Balonda have taught them by their poisoned arrows to keep out of sight. "We did not see one basking in the sun."§ Nansen remarks:—"Curiously enough, one can, as a rule, get nearer to the Seal with the larger vessel than with the boats. They have learned to fear the latter, and often take to the water quite out of range, while one can sometimes bring the ship right up to the floe on which they lie before they decamp."|| On the solitary St. Paul's Rocks, situated between the equatorial coasts of Africa and South America, Sir C. Wyville Thomson, at the visit of the 'Challenger,' writes: "In the morning both the Booby and the Noddy were quite tame, but towards afternoon even these few hours' contact with humanity had rendered them more wary, and it was now no longer possible to knock them down with sticks or stones."¶ Semon had a similar experience in Queensland. "On removing my camp to new hunting-grounds,

* 'Fortnightly Review,' April, 1894.—A curious instance of intelligence in fish is given by Frank Buckland. He was told, on good authority, that the Salmon in the Seame always jump at the weir at 11 o'clock on Sunday morning when they hear the church bells ring. Of course that is not the cause of their activity, "but it so happens that on Sunday morning, the mills being shut down, the water comes down over the weirs in greater abundance than on any other day of the week; the Salmon find this out, and, like wise fish, make the best of their time in endeavouring to get over the weir" ('Life of Frank Buckland,' by Bompas, 2nd edit., pp. 156-7).

† 'Journ. Mental Science,' April, 1898.

‡ 'Mission. Travels and Researches in S. Africa,' p. 242.

§ *Ibid.* p. 273.

|| 'First Crossing of Greenland,' Eng. transl., new edit., p. 85.

¶ 'Voyage of the Challenger.'—The Atlantic, vol. ii. p. 103.

I used to have no difficulty during the first days in stealing up to the water-birds so as to get within shooting range. In an incredibly short time, however, they became shy, and then they were by no means inferior to their European relations in prudence and caution." * Sir Joseph Banks, when in New South Wales with Capt. Cook, found most of the birds "extremely shy, so that it was with difficulty that we shot any of them." † The few travellers who have had the great good fortune to visit a little known and unfrequented island have told us what small fear other animals have for their colleague Man, till they have experienced his destructive propensities, and then how quickly reserve, shyness, caution, and fear rapidly become dominant factors in a hitherto peaceful existence.

Of course there are exceptions to this rule, especially among birds. According to Mr. Macpherson, the tameness of the Ortolan Bunting as observed by him in Spain "is almost ludicrous. So little do they apprehend injury, that they will allow visitors to lie on the grass while they forage round for earthworms." ‡ The writer's own experience in the Transvaal is precisely similar with respect to the Pied Babbling-Thrush (*Crateropus bicolor*). If I lay down at the edge of bush and kept quiet, these birds would not only come close to me, but remain there. Again, Curlews and Golden Pheasants are wild in whatever part of the world they are found, even where the report of a gun has never been heard. § According to Dr. Leith Adams, in Canada "the Purple Swallow has now such a predilection for man's society, on account of the preponderance of insect life which invariably surrounds him wherever he goes, that he has only to construct a small cot with several chambers, and place it on a pole at the door of any solitary shanty in the wild wilderness, when year after year, with the certainty of the seasons, it will be tenanted by these birds in preference to any other situation." || The sound of firearms does not at first universally create terror in birds. D'Albertis relates that, when "fishing with dynamite,"

* 'In the Australian Bush,' p. 53.

† 'Journal,' edited by Sir J. Hooker, p. 302.

‡ 'Roy. Nat. Hist.' vol. iii. p. 414.

§ Sir S. Baker, 'Wild Beasts and their Ways,' vol. i. p. 180.

|| 'Field and Forest Rambles,' p. 150.

"an *Haliastur sphenurus*, with its female, and a young one already able to fly, were perched on the branch of a tree, interested at this novel method of fishing, and not in the least alarmed by the detonation. When I had finished, the male and female picked up the little fishes which I left, and took them to their young one."* Eimer, when staying in the Dutch island of Rottum, in West Friesland, found the Water-Rail (*Rallus aquaticus*), "which is usually so shy, ran about close to me in the ditches so fearlessly that I could almost have caught it with my hands. This island is let by the Dutch Government to an egg-bailiff, whose duty consists in collecting birds' eggs, and therefore no bird is allowed to be hunted there; it is especially forbidden to shoot at them."†

On the other hand, wild animals have chosen to seek the protection of man when pursued by their enemies. The African traveller Anderson once had a Blesbok take refuge at his camp-fire when pursued by Wild Dogs. He also states:—"I have known small birds fly to my waggon and into it, on several occasions, when pursued by Hawks."‡ Andrew Steedman once witnessed a herd of Gnus pursued by a Lion. "The affrighted animals seemed to seek the vicinity of our waggon as a protection from their formidable enemy."§ A lady, describing a great grass and forest fire which took place in South Africa in February, 1869, writes: "The poor Hares and Wild Bucks came to the houses for protection from the flames."|| Another narrator elsewhere states: "Wild Bucks from the surrounding bush came and crouched about, terror-stricken, and one, half scorched to death, took refuge on the stoop of the building."¶ Col. Ward, describing the "hawking" of Jackdaws in the Peshawur Valley, says that a Jackdaw, when closely pressed, "would make straight for the nearest human beings he saw, fly round the men, under the horses' girths, into a dog-cart or buggy, if there was one, and do his utmost to dodge his pursuer, often causing a regular stampede among the horses,

* 'New Guinea,' vol. ii. p. 329.

† 'Organic Evolution,' Engl. transl. p. 227.

‡ 'Twenty-five Years in a Waggon,' pp. 88-9.

§ 'Wanderings and Adventures in Int. S. Africa,' vol. i. p. 154.

|| Quoted by J. Croumbie Brown, 'Hydrology of S. Africa,' p. 184.

¶ *Ibid.* p. 186.

for they could not at all understand the two birds flying about among them in this way.”* According to the Comte de Canteleu, Stags nearly always make for the abodes of men when they are sinking.†

On the other hand, “the Cattle-Heron (*Ardea russata*), in Egypt, when fleeing before the sportsman, shelters itself under the Oxen and Buffaloes, because it knows that it is there protected from his gun.”‡ Bonitos and Albicores may be often observed to congregate about the stern of a ship to escape the attacks of Sword-fish.§

Audubon relates that in the Missouri region of North America, while a number of Indian chiefs were conferring with, and angrily talking to, Mr. Chardon, “he sitting with his arms on a table between them, a Dove, being pursued by a Hawk, flew in through the open door, and sat panting and worn out on Mr. Chardon’s arm for more than a minute, when it flew off.”|| Baldwin saw a broken-winged Golden-Goose chased by three Crocodiles. Eventually the bird took to the bank, and the poor thing “allowed me to catch him on land sooner than face his enemies in the water again.”¶

To fully understand mimicry we must appreciate general animal intelligence, and then we shall probably comprehend how much activity has been displayed by animals seeking protection

* ‘Badminton Mag.’ vol. ii. p. 582.

† Cf. Viscount Ebrington, in ‘Red Deer’ (Fur and Feath. Ser.), p. 245.

‡ Cf. Eimer, ‘Organic Evolution,’ Engl. transl., p. 237.

§ Bennett, ‘Gatherings of a Naturalist in Australia,’ p. 23.

|| ‘Audubon and His Journals,’ vol. ii. p. 44.—A delightful legend is related by Renan on this subject:—“One of the early Buddhas who preceded Sakya-Mouni obtained the *nirvana* in a singular way. He saw one day a Falcon chasing a little bird. ‘I beseech thee,’ he said to the bird of prey, ‘leave this little creature in peace: I will give thee its weight from my own flesh.’ A small pair of scales descended from the heavens, and the transaction was carried out. The little bird settled upon one side of the scales, and the saint placed in the other platter a good slice of his flesh, but the beam did not move. Bit by bit the whole of his body went into the scales, but still the scales were motionless. Just as the last shred of the holy man’s body touched the scale the beam fell, the little bird flew away, and the saint entered into *nirvana*” (‘Recollections of my Youth,’ Engl. transl., p. 116).

¶ ‘African Hunting and Adventures,’ 3rd edit. p. 15.

by adaptive and assimilative efforts. This in no way contradicts, but supports, the doctrine of Natural Selection. The animal survives that can best hide from its enemies,* and this implies that the variations that tend to adaptive and assimilative efforts not only succeed in the battle of life, but by the selective process become dominant, and more and more accentuated with a greater need. Mimicry in the lower animals finds its equivalent in what is described as "tact" among men. Few possess it strongly, many slightly, and more not at all; while others in the struggle for existence depend on different means, and use more varied stratagems. Tact is often a silence which mimics the modest reticence of a learned man and thus conceals the ignorant. It appears as the bluster of the psychological moment when the coward receives an immunity from his protective resemblance to the brave; the rogue often succeeds by mimicking the devout; the sneak assumes the garb of frankness; the lie only triumphs when it simulates the truth.† On the other hand, we must not

* A British lepidopterist has recently remarked: "It is well known how different species of Lepidoptera differ in their habits adopted for protection, some relying on very acute vision, others on their resemblance to their surroundings" ('Entomologist,' vol. xxviii. p. 278).

† An observation made by that keen political and social notist, Greville, illustrates what is here meant:—"I could not help reflecting what an extraordinary thing success is in the world, when a man so gifted as Mackintosh has failed completely in public life, never having attained honours, reputation, or wealth, while so many ordinary men have reaped an abundant harvest of all. What a consolation this affords to mediocrity! None can approach Mackintosh without admiring his extraordinary powers, and at the same time wondering why they have not produced greater effects in the world, either of literature or politics. His virtues are obstacles to his success; he has not the art of pushing or of making himself feared; he is too *doucereux* and complimentary; and from some accident or defect in the composition of his character, and in the course of events which have influenced his circumstances, he has always been civilly neglected" ('Greville Memoirs,' 2nd edit., vol. i. p. 242). Ruskin places tact in a purer and higher plane when he describes it as "sympathy,—of quick understanding,—of all that, in deep insistence on the common but most accurate term, may be called the 'tact' or 'touch-faculty,' of body and soul: that tact which the mimosa has in trees, which the pure woman has above all creatures,—fineness and fulness of sensation, beyond reason,—the guide and sanctifier of reason itself" ('Sesame and Lilies,' edit. 1893, p. 43). Nor must we forget the advice of the old Roman courtier to Sir Henry Wotton, as related by him to Milton,—*pensieri stretti, ed il viso sciolto* (thoughts close, countenance open).

overvalue the efficacy of all these attempted concealments. They are not all successful,—nothing is, absolutely,—but are still means to an end. We are too apt to consider a disguise perfect because we have only accidentally discovered it, while at the same time our existence does not depend upon the result of the search. An amateur or an arm-chair naturalist is speechless with wonder at the least exhibition of wood-craft, a common attribute of many agricultural labourers and gypsies. Jefferies has accurately diagnosed the sense perceptions of a young gamekeeper :—" He will decide at once, as if by a kind of instinct, where any particular bird or animal will be found at that hour." And in a similar manner, but in a greater degree, will be formed the destructive experience of the bird or mammal whose life depends upon the discovery of its prey. Mimicry makes the successful search more difficult, the accidental escape more frequent, and actual extermination by such means alone, impossible. The enemy in his close pursuit finds other prey to satisfy his hunger, like the gold prospector who in his quest may come across non-auriferous minerals which tend to assuage his financial longings; and so an average of destruction is reached, and none alone are compelled to be "confessors" to nature's inexorable rule.

It is probable that highly protected or mimicking species are only destroyed by their most acutely sense-organized enemies, and have a general immunity from the attacks of the ordinary animal pirates. We have no more reason to predicate a dead level in the intelligence of a single species or genus of animals than we have to believe that the same character exists in *Homo sapiens* himself. For in nature, *pace Ecclesiastes*, the race is to the swift, and the battle is to the strong, though the exceptions of "time and chance" may prove the rule. Stroll along a trout stream when anglers are at work, and notice how empty baskets reward the majority, or those who perceive not. Now observe the skilled killer of Trout, how he will detect a hidden fish under the opposite bank, and soon possess the same.* Know-

* Some persons' eyes seem to have an extraordinary power of seeing through water, and of distinguishing at a glance a fish from a long swaying strip of dead brown flag, or the rotting pieces of wood which lie at the bottom. The ripple of the breeze, the eddy at the curve, or the sparkle of the sunshine cannot deceive them; while others, and by far the greater number, are dazzled and see nothing."—(Jefferies, 'Gamekeeper at Home.').

ledge of habits combined with power of eye and hand are successful, and command the intense respect of the ordinary floggers of the stream. We may possess the most accurate knowledge of whist, and play according to the strictest rules, but one of the quartette is a Napoleon in the game, he judges and acts with an instinctive finesse, and the odd trick is won. Or take the boys in a large stable who are trained to ride racehorses at exercise: how few become jockeys; to possess "hands," judgment, nerve, and a knowledge of pace is only an occasional gift of the gods. And so in nature at large; all are not masters of the game, and the mimicking species have a general immunity from attack, save from those incontestable creatures who amongst all animal life, including our own, levy their own rates, successfully collect their own tithe, and command the attention, if not always the love, of their fellows. Animal disguise and mimicry serve an ever purpose, if they do not constitute a constant end; they are often partial and exceptional, and not in result universal. Like human impostors, they are by such means frequently able to live, thrive, and perpetuate their kind. But all depends upon not being found out; there must be many Mr. Pickwicks and few Sherlock Holmes. To believe that a gradual mimicry can slowly arise by the process of natural selection which shall be anything but a very partial defence of the eatable from the eaters, is to imagine our most intelligent and civilized communities capable of being made invulnerable from the depredations of thieves and swindlers. An example is afforded by the colour of the Common Hare. Prof. Poulton makes much of this. He remarks: "It would be hardly possible to meet with a better example of protective colouring and attitude than that of the Hare as it sits motionless, exactly resembling a lump of brown earth, for which indeed it is frequently mistaken."* But the protection thus assumed appears to be founded on partial observation. To a casual evolutionist in search of evidence, whose knowledge of the animal is not intimate, and whose pursuit of the same is a chase not sharpened by necessity, the Hare affords illustrative importance. But let a sportsman, a poacher, or a farmer speak on the subject, and the whole conclusion vanishes. Jefferies may at least be quoted as a

* 'Colours of Animals,' p. 67.

good and careful observer:—"It is not easy to distinguish a Hare when crouching in a ploughed field, his colour harmonises so well with the clods, so that an unpractised eye generally fails to note him. An old hand with the gun cannot pass a field without involuntarily glancing along the furrows made by the plough, to see if their regular grooves are broken by anything hiding therein." "If you watch the farmers driving to market, you will see that they glance up the furrows to note the workmanship and look for game; you may tell from a distance if they espy a Hare, by the check of the rein and the extended hand pointing."* Though the American Hare has the colour of its pelt turned grey in winter, it is still much persecuted by the Great Virginian and Snowy Owls, "which prey extensively on the animal, keeping it in a constant state of dread, especially during winter, when, in common with other rodents, it seeks to evade the stoop of rapacious birds by diving instantly headlong into the snow, thus escaping them, but ensuring destruction by man, and such animals as the Fisher-cat and Lynx, who can easily dig it out."† It must not be overlooked that many zoologists and evolutionists estimate the survival of the Hare as due to the protection acquired by their speed, the animals having lived under conditions in which only the swift could escape the attacks of their enemies. Besides this aspect, the animal trusts to its highly developed cunning. Mr. Kearton, a good and practical observer, writes:—"When Hares are going to seek their day or sleeping quarters, they practise a very ingenious trick in order to mislead and baffle their enemies. This consists of travelling for some distance in a direction they have no intention of pursuing, and then doubling back exactly along their own track for a good way, and suddenly leaving it by making a tremendous sideward bound to right or left. This being accomplished to their satisfaction, they trot off at right angles to the path they have just left, and go to their forms."‡ The Hare itself seems to be well aware that the safety gained by colour-concealment is very precarious. The poet Somerville knew this.

* 'Wild Life in a Southern County,' new edit., pp. 7-8.

† A. Leith Adams, 'Field and Forest Rambles,' p. 80.

‡ 'Wild Life at Home,' p. 114.

“ So the wise Hares
Oft quit their seats, lest some more curious eye
Should mark their haunts, and by dark treacherous wiles
Plot their destruction.”—(‘The Chase,’ Book II).*

The test of protection is concealment from the keen search of enemies, not merely an assimilative process, as noted by casual observers. Of course a partial concealment is a partial protection, but it is difficult to see how this applies to the Hare, and in the Transvaal, where most of these lines were written, I found it as foolish an animal, and one as easy to discover and shoot, as in England. Dietrich de Winckell, who according to Prince Kropotkin “is considered to be among the best acquainted with the habits of Hares, describes them as passionate players, becoming so intoxicated by their play that a Hare has been known to take an approaching Fox for a playmate.”† Describers are often carried away by their enthusiasm for the theory of mimicry and give their pens great licence. Thus, Dr. Meyer, speaking of the neighbourhood of Kilima-njaro, writes: “The insects, too, have their ‘magic mantle’ of invisibility. No wonder it is difficult to make a collection, when the Butterflies and Crickets look like leaves and dry blades, the Cicadæ like leaf-stems, the Spiders like thorns, the Phasmodeæ like bare twigs, the Beetles like stones and bits of earth, the Moths like mosses and lichens.”‡ Much, very much, has been made of the mimetic resemblance of the upper surface of Flatfishes to the bottom on which they rest. Mr. C. L. Jackson has given the result of a most interesting experiment he made by placing a number of small Flatfish in a tank which contained ten or twelve large Cod averaging fully twenty pounds weight each. These at once dashed after the Flatfish, “which instantly covered themselves with sand and apparently disappeared. The Cod, however, knew better. They commenced to hunt for them, carefully and systematically quartering their ground as a well-trained pointer would do, and affording a beautiful illustration of the use of the curious ‘beard’ possessed by many members of the Cod family. By-and-by, one of them, by means of this feeler, detected one of the

* Cf. C. C. Coe, ‘Nature versus Natural Selection,’ p. 184.

† ‘Nineteenth Century,’ vol. xxviii. p. 706.

‡ ‘Across East African Glaciers,’ p. 80.

youngsters and put it up. Away it went, full speed, followed by one, two, or three of the huge monsters. No Greyhound fancier ever saw a better bit of coursing as the little chap doubled and turned with the greatest agility, while over and over again the great lumbering Cod overshot their mark, and the little fish went to earth, only, however, to be again routed out and hunted until not one was left."*

The theory of mimicry is probably the still imperfect recognition of a great truth which is struggling to survive a mass of more or less irrelevant evidence too frequently offered in its support. It has long been regarded as an unconscious registration of a preservative action of Natural Selection; it is here suggested that it is largely an act of conscious animal volition. Whatever view be held, this alone is certain, that the theory in either its demonstrated or suggestive enunciation has been the means of a vast record of facts pertaining to the life-histories of animals and plants which would otherwise have remained either unobserved or disregarded.

* 'Lancashire Sea Fisheries,' pp. 34-5.

THE MOVEMENTS OF STARLINGS.

By H. E. FORREST, Hon. Sec. Caradoc and S. V. Field Club.

STARLINGS are so familiar to us all, whether living in town or country, that it would be natural to suppose we know all about their habits and economy, and that it would be almost impossible to find anything fresh to say about them. Up to a very recent date the writer was of the same opinion; but certain events led to his making investigations, and these have resulted in the penning of the present article, which he hopes will at least add to our knowledge of the movements of these interesting birds at different seasons of the year.

Perhaps no habit of the Starling has been more often described than their collecting in multitudes in autumn to roost together in reed-beds, &c. This may conveniently be made the starting-point in our investigations, and Shropshire the field of our enquiries.

The following is a list of the principal "roosts" in the county, with details as to the character of each place, and the name of the observer who has reported on the same:—

Alkmond Pool, two miles north of Shrewsbury.—A small sheet of water with trees on one side, and beds of osiers and reeds on projecting tongues of land on opposite sides. The Starlings roost on the reeds in tens of thousands.—*H. E. Forrest.*

Moreton Corbet, six miles north-east of Shrewsbury.—A coppice called Dawson's Rough; one of the biggest roosts in the county. The Starlings here probably number over a million, and roost on the hazel underwood. Pheasants roost on the big trees, but the odour of the Starlings and their droppings causes them to quit each year. The keepers have tried to drive away the Starlings by shooting, &c., but without any final success.—*W. H. Parry.*

Colemere Mere, Ellesmere.—A large sheet of water with extensive reed-beds. The Starlings used to resort to the reeds

in countless numbers, but during the last few years have come in greatly reduced numbers.—*Brownlow R. C. Tower.*

Llanforda, Oswestry.—In a wood.—*G. D. Lees.*

Chorlton, near Whitchurch.—In a covert. The birds came in millions, and destroyed the trees and undergrowth.—*G. D. Lees.*

Breidden Hills.—Two coverts at Great Woolasson.—*Rev. W. F. L. Harrisou.*

Nesscliffe.—At the south end of Ensdon Clump, in bushes.—*Chas. Kempster.*

Baschurch.—By the pool in Boreatton Park, in shrubs.—*E. H. O. Sankey.*

Ruyton XI. Towns.—In a wood; and at Fennymere, a reedy pool surrounded by trees.—*E. H. O. Sankey.*

Caynton, Newport.—In the reeds round the pool, and in an osier-bed.—*G. H. Paddock.*

Rowton Gorse, near Crudgington Station.—A Fox-covert, mainly privet bushes. Starlings roost here in such numbers that they drive the Foxes away. Large numbers were shot in hopes that the birds would leave, and a portion removed a short distance to Pointon; but the original roost was never forsaken.—*A. E. Payne.*

Kilsall, Shifnal.—In a reed-bed.—*Daniel Jones.*

Albrighton.—At Snowdon Pool, on the Patshull estate—the borders of Shropshire and Staffordshire—on reeds.—*F. H. Joynson.*

Bridgnorth.—At Tasley, in a covert with osiers.—*F. H. Joynson.*

Bridgnorth.—At Hilton, five miles north-east, in a plantation. Also at Gatacre Park; Starlings used to resort in thousands to a laurel plantation, which in a few years they destroyed, and then left.—*E. Ll. Gatacre.*

Madeley.—Three roosts close together were used by large flocks till recently, but are now almost deserted. One was in a covert called Lee Dingle, another an exposed plantation on high ground, and the third a rough field full of high hawthorn bushes.—*R. E. Anstice.*

Harley, Much Wenlock.—In bushes on a hill.—*T. R. Horton.*

Ludlow.—Oakley Park, on reeds by the decoy pools.—*H. Gray.*

Ludlow.—Moor Park. In a small plantation the birds roost in tens of thousands.—*J. Palmer.*

Woofer-ton.—In an immense hawthorn hedge twenty to thirty feet high.—*J. Palmer.*

Many interesting details have been furnished by the various observers, but want of space prevents our giving anything beyond a summary.

In the great majority of cases the roosts have been occupied by the Starlings *regularly for upwards of twenty years.* In only a few cases have the established roosts been deserted, and then probably the birds have only gone to a neighbouring roost. *In no instance has an entirely new roosting-place been started.* It will be noticed that the roosts are of three classes—(1) on reeds, (2) on trees or underwoods, (3) on osiers. We shall see later on that the nature of the roost has an important bearing on the duration of its occupancy by the Starlings. Lastly, it will be seen by a reference to a map that the distance between one roost and another varies from less than two miles to about thirteen miles. There are considerable tracts of country from which no reports have been sent in, and it would be safe to assume that there are a few roosts in these districts which are not recorded in the above list. On this ground *the average distance of the roosts from one another can scarcely exceed eight miles.*

Before quitting this part of the subject a few details may be given regarding some of the roosts.

Mr. W. H. Parry resides at Shawbury, close to the Moreton Corbet roost. He says that there is an enormous pear tree in his orchard, used by the Starlings as an outpost. They alight on it in great masses, so that it quite bends beneath their weight, and, upon their quitting it, the tree rebounds with such force that it continues to oscillate for some time. This and a few other trees in the surrounding fields are only used as outposts; the birds do not roost there, but in the coppice farther on. When alighting on the pear tree the birds generally make a loud chatter, but not always—sometimes there is no noise but the rushing sound of their wings. The ground and hazel underwood in the coppice are covered with the birds' droppings, and the fetid odour arising from these and the massed birds is perceptible at a considerable

distance. The number of birds assembling each night in autumn at this roost is enormous, and towards the end of September or early in October it is further increased by flocks from Caynton and other places. The reason for this is curious. Where the roost is situated on a reed-bed, the reeds get so completely broken down in autumn—when they are much more brittle than in summer—that the Starlings cannot get a footing on them. Thus it happens that roosts of this kind are always deserted early in October. At Caynton Mr. Paddock says that when the reeds break down the Starlings resort to a bed of osiers on another part of the pool, and finally desert those when the leaves fall off. Roosts of the other class—on trees and underwoods—are resorted to much longer. Indeed, the one at Moreton Corbet is never quite deserted; a few small flocks resorting to it through the winter and spring, and even in the breeding season.

The general habits of the Starling may be thus described: During summer they scatter in pairs all over the country to breed, except perhaps small flocks of young birds that do not breed. Even now they seem not to lose their gregariousness, for I have often found from twenty to thirty nests within such a limited area as the ruins of Haughmond Abbey. This is probably more apparent than real, and is due to the number of convenient nesting-holes in such localities. The nest is generally placed in some kind of cavity—in a hole in a tree or wall, under the eaves of houses, amongst piles of loose stones, in a rotten tree-stump, &c. Very rarely it is open to the air, and last year I noticed a very queer instance on the Buries, close to my house at Bayston Hill. It was on a large branch of a very tall ash tree close to the trunk, and, as far as I could see from below, was made entirely of sheep's wool! I watched the bird on and off the nest several times, or should never have recognized the lump of wool as a Starling's nest.

Mr. R. Moses writes that for several years in succession two Starlings' nests were to be seen in Shrewsbury, wedged in between two chimney-stacks four inches apart; they rested on nothing, and it is a mystery how the birds began them. Mr. Palmer says he has several times found the nest in ivy against a tree-trunk.

Ordinarily the nest is an untidy mass of hay or straw, lined

with a few feathers or bits of wool. The eggs are of a lovely pale blue, sometimes white, and vary greatly in size and proportions. As soon as the young are hatched the parents display intense activity in searching for food to satisfy their enormous appetites. There are generally five or six nests round my house, and I often watch the Starlings from my bedroom window while dressing in the morning. They regularly search every inch of the lawn for worms, insects, and grubs, and never failed to do this during the past dry summer, although, as there were hardly any worm-casts to be seen, the worms had evidently left the surface-soil and retired to the moister earth below; so that the search must have been rather a "forlorn hope." As soon as the Starlings have exhausted the lawn they go farther afield, and they do an immense amount of good by destroying noxious grubs and insects. In reply to a letter of mine on the subject, the Rev. J. B. Meredith writes:—"I agree with you that Starlings are most useful birds. I do not think they affect the earthworm which makes the worm-casts so much as the wireworm; hence their diligent search of your lawn even in the drought. You have evidently never had your cherry trees cleared by them in dozens and in scores as I have every year; and I have also caught them in the act of stealing raspberries, currants, damsons, and ripe pears—watched them gorging at them—though they do not systematically go for these as they do for cherries."

In regard to this matter, the only cherry tree in my garden is a "Morello," and the fruit is too sour for most birds. I have not seen the Starlings attack the other fruits mentioned, but have seen Blackbirds doing so frequently.

Mr. G. H. Paddock relates that his father used to shoot the Starlings round the house at Caynton, Newport; he urged him not to do so on the ground that they were such useful birds in destroying worms, &c., and at last persuaded him to give them a year's trial. As he anticipated, "the difference in the turf was most marked; it was no longer unsightly from worm-expellings, the Starlings hunting it over first thing every morning." Since then they have been protected; an empty oyster-barrel which Mr. Paddock put up for them in a tree was adopted for a nesting-place by a pair of Starlings the very next morning. Under date Dec. 9th, 1899, Mr. Paddock adds:—"During this summer the

whole of my choice carnations were attacked by wireworms, and I noticed Starlings continually amongst the plants. This appears to bear out Mr. Meredith's suggestion." Dr. Sankey says:—"Starlings feed greatly on animal food; those that I dissected some time back had their crops full of caterpillars," and they pick them off oak trees when infested. The stomachs of some that were killed at Shawbury during frosty weather in December were found to contain spouts from wheat, as well as spurting wheat-grains, and a few small weed-seeds. The damage done to one wheat-field necessitated its being resown. On the other hand, Mr. Beckwith found that no bird checked the ravages of the *Agrotis* moth so effectually as the Starling.

To return to our subject. As soon as the young are able to fly the Starlings go out every morning to feed, keeping together in family parties, and particularly frequenting meadows where sheep and cattle are grazing, to pick up the insects disturbed by their feet. They return each night to the nest to roost. The young grow so rapidly, however, that soon there is not room for them in the nest. In this emergency some other sleeping-place has to be found, and what place would so naturally recur to the minds of the parent birds as the spot where they roosted in the previous autumn? The parents and children start off together, and on the way fall in with another little family party bent on the same errand; then another and another, till, by the time the tryst is reached, the flock numbers several hundreds. Perhaps for the first few evenings the total assemblage will not be very large, but as successive families realize the necessity of quitting their nesting-places the congress increases night by night. Very few sights in the bird-world are so impressive as one of these great gatherings of the clans. About an hour before sunset the first flocks begin to arrive at the appointed place. These do not settle down at once, but continue to fly around; soon other flocks arrive in quick succession from all points of the compass, till the heavens are literally darkened by the cloudy masses of birds. They now proceed to execute in the air a series of complicated evolutions, like regiments of soldiers on a review day—charging forwards, wheeling to right and left, crossing and recrossing over and under, converging and diverging, coalescing and separating, till at last, just after sunset, as if by one consent,

the whole body of birds descends like an avalanche, with a mighty rushing sound of wings, and covers every tree, shrub, and reed with a living freight so heavy that they bend almost to the earth beneath their burden. Now ensues a perfect babel of chatter, which continues for several minutes, till the last "good nights" have been said, and darkness and silence descend on the scene. The effect of any sudden sound, such as the stroke of an oar falling flat on the water, is startling. Instantly the thousands of Starlings rise into the air uttering cries of alarm, with much fluttering of wings, only to resettle the next minute, amid congratulatory murmurs of satisfaction, till silence is again restored.

Not always, however, is the scene thus peaceful. If there is a Sparrowhawk in the vicinity that has not fallen a victim to the keeper's gun—alas, how few *do* escape—it can hardly fail to discover such a happy hunting-ground as this. Two of my correspondents mention that Sparrowhawks have been seen haunting the roosts, and occasionally dashing into the throng to seize a Starling, its companions fleeing in every direction with mournful terror-stricken screams.

Midnight. All quiet.

Morning dawns. The Starlings begin to wake and twitter, and preen their feathers. Before the sun is well up they are off; scattered all over the country to their daily avocation of picking up their food. Now, however, instead of keeping together in families, they go about in small parties, and this habit they retain throughout the remainder of the year.

We now approach the most difficult part of our subject—the movements of Starlings between the middle of November (when the big roosts are nearly deserted) and the following spring, when they return to their nesting-places. It would only weary the reader to state all the little details upon which the following conclusions are based, so I will here only indicate briefly what I believe to be the actual facts. In order to make the matter clear, it will facilitate matters if we divide our native Starlings into three main groups :—

- (1) Starlings that migrate.
- (2) Starlings in towns.
- (3) Starlings in the country.

Anyone who observes our local birds must notice that the number of Starlings in any given neighbourhood suffers a great and sudden diminution some time in late autumn, and there is pretty good evidence that this is caused by emigration. The Rev. R. T. Kempthorne, who lived formerly in Cornwall, tells me that in that county the Starling is only a winter visitor, and rarely, if ever, breeds there. Mr. Howard Saunders, in his 'Manual,' says:—"Large flocks arrive on our east coasts in autumn, at which season there is a marked migration westward, localities in the interior of this country which have been frequented during the summer being then almost deserted, while great numbers visit the south of Ireland. . . . Throughout the greater part of the Mediterranean basin it is only a cold weather visitor, although at that season it occurs in almost incredible numbers." Towards the end of autumn enormous flocks of Starlings and Peewits appear on our western coasts, particularly in Merionethshire, Pembrokeshire, and Cornwall. We may conclude, therefore, that a large proportion of our inland Starlings leave us then, and go westwards. In reply to a letter of mine, Mr. Howard Saunders writes that the Starlings in the north of Europe, where in winter the ground is as hard as iron, go to the south.

(2) Starlings in towns, during winter, assimilate in their habits to Sparrows. They are hardly at all gregarious, but live on housetops, feeding on anything that falls in their way. It rarely happens that more than two or four are seen together, and I fancy that these are paired birds returning to their old nesting-places as a kind of head-quarters whence to forage around.

(3) Starlings in the country, during winter, behave quite differently; they go about in small flocks, sometimes alone, but more often in company with other birds that frequent fields, especially Rooks and Peewits. Around Shrewsbury, Peewits are very numerous, and it seems to me that there exists some bond of sympathy between them and Starlings, for we rarely see a flock of Peewits without its attendant train of Starlings. If the Peewits move into the next field, the Starlings do the same; while, if the former continue to wheel about in the air for some time, the Starlings wait till they settle, and then rejoin them. In severe weather Peewits leave the inland meadows and descend to the coasts in search of food. On Dec. 11th, 1899, a hard

frost began. Next day all our local Peewits disappeared : *so did the flocks of Starlings.* There were no Peewits to be seen after that date, nor any Starlings (except pairs about houses) till Jan. 4th, when *both re-appeared* in flocks on the meadows near Shrewsbury.

Whether each group of Starlings attaches itself to a particular group of Peewits or Rooks, we have no means of knowing, but it is hardly likely, as the size of the flocks varies greatly from day to day. The reasons why these different birds associate together are probably :—

- (1) That they are similar in their tastes as regards food.
- (2) That they are all very wary birds, and associate for mutual protection.

Parenthetically, we may remark that the Starling is remarkable for unfailing good temper—he never quarrels with his company, nor is he treated as an intruder.

At night the Starlings that have kept company with the Rooks and Peewits all day retire to an ivy-clad tree or wall to roost. They may then be found occasionally in numbers up to a hundred or two ; but these are only accidental gatherings—very different in character to the big roosts before-mentioned—and the birds do not travel any distance from their feeding-ground ; they merely go to roost in the nearest convenient place.

The following incident evinces the existence of a strong spirit of comradeship amongst Starlings. Mr. D. H. Meares shot a Starling on the ground out of a flock at about eighty yards distance, when the whole flock rose and hovered round their companion, swaying up and down in the air over it in a triangular formation ; some even tried to lift it ; this continued for several minutes.

Reverting for a moment to the subject of "Roosts," we noticed, early in this paper, that the average distance between one roost and another was not more than eight miles, so that the radius of the area appropriated to each would be four miles. If we treat the area as a square it would contain sixty-four square miles. I believe that if *all* the roosts were recorded, we should find that this estimate is over the mark, and that the relative area is really much smaller. Anyone who has witnessed, as I have, the enormous multitudes of birds that assemble at some of

the roosts will hardly conceive it possible that they are natives only of the limited area surrounding the roost, and we can only conclude that the true natives of the district receive additional numbers that migrate thither from outside districts or even from the Continent.

I will conclude with a statement which may perhaps be received with incredulity. Nearly all ornithological writers say that Starlings breed two, and occasionally three times a year. Careful observation has convinced me that a very large proportion of Starlings—perhaps one-half—rear only one brood in the year; many rear two broods. I have never known three broods, and there are some Starlings that do not breed at all. Mr. G. W. Murdoch, Natural History Editor of the 'Yorkshire Weekly Post,' writes in reply to a query on this point:—"In Hants Starlings *very often* breed twice a year; I never knew them do so in Scotland. I am of opinion that a good many Starlings *never breed at all*, but for what cause I know not. That is also the opinion of my friend the Rev. H. A. Macpherson, M.A., author of 'The Fauna of Lakeland.'" Mr. E. S. Cobbold writes in April, 1899:—"Why are the Starlings congregating in flocks now? Hundreds fly over Stretton from the south-east at 5 or 6 p.m. to roost, I think, in a Scotch fir-plantation near; I have seen them three nights in succession, and on April 3rd I saw rather large flocks down by Craven Arms feeding together." He adds that at the very time when he saw the flocks flying overhead, the Starlings that were breeding about his house were busy looking after their nests or young, and did not take any notice of the others, much less offer to fly off after them. "Is it," he concludes, "the autumn habit not yet abandoned? I am inclined to think *not*, for I remember in previous years noticing them early in summer, when I supposed they had done breeding."

A simple and probable explanation of the phenomenon is this:—When Starlings rear *two* broods in the year, the second brood would be younger than the first by some two months or so. When the breeding season comes round in the following spring, the second broods are not sufficiently adult to breed, and, not having any duties to call them elsewhere, they naturally continue to resort at night to the old familiar roost. This

supposition also accounts for the presence of a small number of birds at the roost, even during the breeding season—a fact alluded to at the end of the description of the roost at Moreton Corbet.

With reference to the migrations of the Starlings that leave us, we seldom witness the actual departure, and still more seldom see their return; but this is not singular—we may say the same of all inland migrations. On the coasts the departures and arrivals are much more evident. Mr. D. H. Meares saw, on one occasion, several thousand Starlings roosting *on the ground* in a ploughed field close to Shawbury village; he supposed that they were preparing for a night flight. In returning to their inland quarters in spring, the birds arrive on our coasts in large numbers, but, after resting awhile, they continue their flight in such small bodies that they are not noticed.

The Starlings which remain here through the winter, in company with Peewits and Rooks, exhibit a tendency to break up into gradually smaller and smaller parties. Towards the end of February many pairs are to be found at their old breeding haunts. At this period the Peewits still keep together in large flocks, not pairing off till March; by that time their attendant Starlings have deserted them.

NOTES AND QUERIES.

MAMMALIA.

INSECTIVORA.

Curious Variety of the Mole.—During last autumn five Moles (*Talpa europaea*) were caught on different dates at Morvilie, near Bridgnorth, Salop. They were of a peculiar colour—glossy light pearl-grey all over, except the under parts, which were bright buff, the general effect being very pretty. On Nov. 11th Mr. W. F. Warren kindly sent me one in the flesh, which is now in the Shrewsbury Museum. I have seen mounted cream and buff coloured Moles before, but never one like the above.—
H. E. FORREST (Shrewsbury).

Lesser Shrew in Worcestershire.—As upon reference I cannot find that the Lesser Shrew (*Sorex minutus*) has been taken previously in this county, it may be as well to record one taken by the writer at Lower Hagley on Jan. 19th last.—J. STEELE-ELLIOTT (Clent, Worcestershire).

Water Shrews taken Three Miles from Water.—During a short trip to Banstead last August, trapping small mammals, I was lucky enough to catch three Water Shrews (*Neomys fodiens*) (two males and a female), two in a small copse, and one in a hedge adjoining, at a distance of about three miles from water. The weather was excessively hot, and the ground like a rock. I think this is the first authentic British record of the occurrence of this Shrew at such a distance from water. I am aware that it is well known that this Shrew can exist at some little distance from water, as the following quotations show; but I think my record will be found to be the farthest known:—Bell's 'Brit. Quads.' : "It is often found at some distance from water. There can be no doubt that it occasionally seeks its food on the land, probably when it has exhausted the ditch or brook to which it has attached itself." Also Jenyns, in his 'Brit. Vertebrates,' mentions: "My specimen was taken in a corn-field at some distance from any water." If this question were looked up I have no doubt it would be found that this animal can live entirely away from water like the Vole.—C. H. B. GRANT (Putney).

A V E S.

Early Appearance of Chiffchaff.—On Feb. 25th I noticed a Chiffchaff (*Phylloscopus rufus*) in a local farmyard. The bird was briskly catching flies, and appeared to be in good condition.—WM. DELVES, JUN. (Maynard's Green, Horeham Road, Sussex).

Great Tit nesting in active Bee-hive.—In the Chester Museum there is exhibited in a glass case a Blue Tit's nest in an empty bee-hive. A far stranger incident occurred last year at Ludlow. A Great Tit (*Parus major*) built a nest and laid twelve eggs in the midst of an active bee-hive. The bird went in and out through the same entrance-hole that was used by the Bees, and neither bird nor insects seemed to interfere with each other. The hive was about half-full of honeycomb, and the Bees hard at work the whole time. The eggs were taken on May 2nd by Mr. J. Palmer, Secretary of the county Bee-keepers' Association, who reported the circumstances to me.—H. E. FORREST (Bayston Hill, near Shrewsbury).

Nesting Habits of the Great Tit.—While thanking Mr. Tuck for his suggestion (*ante*, p. 82), I should like to say that I am aware that *Parus major* is sometimes in the habit of covering the eggs of an incomplete clutch with loose nest-materials. In these cases the nests are "apparently unfinished." Among the tenants of his nesting-boxes Mr. Tuck does not mention the Robin, which has used boxes here.—O. V. APLIN (Bloxham, Oxon).

Marsh-Harrier in Berkshire.—A Marsh-Harrier (*Circus aeruginosus*), which, I believe, to be a three years' old cock, was shot Oct. 2nd, 1899, by my nephew Ralph Cooper; his wing was only just tipped, and in three weeks he could fly quite strong again. I keep him in a large wire aviary, where he can have a good thirty yards' fly when he wishes, and have one corner covered on the top, and the sides done up with ivy, where he roosts on the top of a large bavin. He is fed on Sparrows, Rats, and Rabbits.—T. TERRY COOPER (Swallowfield, near Reading).

[This note was received through our correspondent Mr. George W. Bradshaw, who writes that the bird has also been seen and identified by Mr. H. M. Wallis, M.B.O.U., of Reading.—ED.]

Nesting of the Hobby in Shropshire.—Last summer a pair of Hobbies (*Falco subbuteo*) nested near Ludlow, utilizing a Crow's nest several years old in the top of a large oak tree, but adding a little fresh lining of birch-twigs and bracken-stalks. Early in May the male was found dead near the tree, but the hen went away and quickly returned with a new mate. The first clutch of three eggs was taken July 1st, but it is believed that the birds bred again, as they remained in the neighbour-

hood, and were seen repeatedly throughout the summer.—H. E. FORREST (Bayston Hill, near Shrewsbury).

The Great Lapwing Year. A Correction.—I beg to correct an error in my notes on Golden Plover and Lapwings (*ante*, p. 40), in eleventh line from top. The words "more numerous than in any year since 1878 (the great Lapwing year"); it should be 1879.—ROBERT WARREN (Moyview, Ballina).

Land Birds at Sea.—With reference to the interesting communication on this subject by Surgeon Hurlestone Jones (*ante*, p. 51), I am able to add two species to his list of land birds observed straggling out to sea. On February 24th, 1891, on S.S. 'Wordsworth,' bound for Brazil and the Plate River, a small unfamiliar Warbler settled upon the deck, and was seen several times during the day. We had last sighted land at Cape Finisterre, and the observations for noon of that day (24th) showed that our position was lat. $40^{\circ} 12'$ N. by long. $12^{\circ} 48'$ W., so that at the time we were a considerable distance from the coast of Portugal. The little bird followed the vessel the whole day, but was not seen the following morning when we arrived at Madeira about six o'clock. I was unable to identify the species, but a conspicuous yellowish stripe over the eye led me to believe it was *Phylloscopus superciliosus*. Whether our little visitor reached land in safety or was drowned I am unable to say. Upon the previous day, in lat. $44^{\circ} 23'$ by long. $10^{\circ} 24'$, a Sky-Lark (*Alauda arvensis*) flew close to the ship, but was not observed to settle, and soon disappeared. At about the same position, on April 29th, in the middle of the Bay of Biscay, two others accompanied the vessel for some distance. Another species which I have observed under similar conditions is the Wheatear (*Saxicola axanthe*), which flew on board the Orient steamer 'Garonne' on Aug. 27th, 1892, off the coast of Norway, long out of sight of land, but unfortunately my notes do not give the exact position. We were, however, about a day's journey from the land. A Turtle-Dove (*Turtur communis*), Starling (*Sturnus vulgaris*), and House-Sparrow (*Passer domesticus*) accompanied us for nearly a day between Harwich and Hamburg on Oct. 1st, 1899. At the time the birds were observed we must have been nearest to the coast of Holland or Friesland, and I have no doubt that they all reached the land in safety.—MALCOLM BURR (New College, Oxford).

PISCES.

Sea-Lamprey at Shrewsbury.—On June 13th a boy caught a Sea-Lamprey (*Petromyzon marinus*), thirty inches long, in the Severn, below the Welsh Bridge, at Shrewsbury. It rarely occurs so high up the river, though formerly common in the estuary.—H. E. FORREST (Bayston Hill, near Shrewsbury).

ORGANIC EVOLUTION.

Remarks relating to Mimicry.—I am obliged to Mr. C. T. Rope for informing me (p. 85) of the likelihood of black Ducks throwing white feathers; in the case of the drake and two ducks under my observation the drake alone did this. The nesting Fowl certainly does not hiss as clearly as a Duck; nevertheless it makes a puffing sound of the same nature, and apparently made in just the same way. It would be indeed a triumph of mimicry for an animal not only to feign death, but also the appearance of the decay which usually supervenes. In the case mentioned by Mr. Rope—that of *Bombyinator igneus*—the shrinking might perhaps be caused by an effort towards *smallness* rather than the appearance of decay; otherwise a batrachian might be capable of mimicking its own skeleton, which is hardly likely. Unconscious mimicry, apparently due to sexual relations, is a common feature in wedded couples, who notoriously tend to resemble each other in facial expression, if not in feature, after many years of cohabitation. This may be consequent upon developed similarity of thought, or something else. Some cynics would deny that it was due to mutual affection.—CHARLES A. WITCHELL.

NOTICES OF NEW BOOKS.

The Races of Man: an Outline of Anthropology and Ethnography.
By J. DENIKER, Sc.D. (Paris). Walter Scott, Limited.

ENGLISH readers have long been familiar with the writings of French anthropologists. The names of Broca, Topinard, and De Quatrefages are quite household words among those who study the zoology of their own kith and kin, while the present work of Dr. Deniker will further increase our respect for the capacities of anthropologists across the Channel. There is always room for a fresh book on Man; the multitude of subjects that make for his history are truly complicated; each student and professor is always stronger on his particular specialty than on others; we leave the school of anatomy to study written records; from the unwritten testimony of prehistoric archæology we turn to the problems of philology; the physician and the zoologist compare notes; one measures the skull, another photographs the features; the traveller publishes his notes, the missionary gives his experience; the prison, the hospital, and the lunatic asylum alike contribute to our knowledge; the statistician, the comparative theologian, and the recruiting sergeant all have something to tell, while many a forgotten book contains the only detail of a vanished or vanishing race. Consequently to bring the subject up to date is a quest and not a feasibility; there is always something behind the arras.

Dr. Deniker in the present volume has added much to our knowledge by referring us to recent work that has been done, and his bibliographical notes are valuable. The general reader may learn much as to races other than savage, even as regards such a familiar being as the Jew. Of these people, contrary to general ideas, only some 250,000 are stated to be found in Asia, and Palestine can only claim about 75,000 in the present day. "Their total number is estimated at eight millions, of which the half is in Russia and Rumania, a third in Germany and Austria,

and a sixth in the rest of the world, even as far as Australia. The great majority of Jews are unacquainted with *Hebrew*, which is a dead language; they speak, according to the country they inhabit, particular kinds of jargon, the most common of which is the *Judeo-German*." A foot-note also points out the well-established fact that the isolation of the Jews from the rest of the peoples is not complete, as other races have been converted to Judaism. This may be taken as an instance of the concise information to be found in the volume, which is well illustrated from original photographs.

Among the few opinions that Dr. Deniker allows himself to formulate is one as to the use of the laryngeal sacs in the Orang-utan. These, considerably larger than those of the Gorilla, may "serve him as air-cushions to lessen the enormous weight of the jaw resting on the trachea."

A Book of Whales. By F. E. BEDDARD, M.A., F.R.S.
John Murray.

THE Cetacea have long required treatment in a handy but authentic book of reference. They have received great attention from two late naturalists who both held high official positions at the British Museum—Dr. Gray and Sir William Flower. Dr. Gray wonderfully increased the number of these animals by the descriptions of proposed new species, while his successor, Sir William Flower, endeavoured to analyse these creations of the printing press and to restore the balance of Cetacean nature. Now, as Mr. Beddard writes, the student of the Cetacea "has to deal with not more than thirty-five genera and almost eighty species."

The origin of these immense creatures, which "are not only the largest of living mammals, but the largest of all animals, mammalian or otherwise, which have ever existed," is still unsettled, and Mr. Beddard takes a cautious position after a consideration of the views of both Professors Albrecht and Max Weber, the first of whom inclines to the view that the Cetacea are the nearest thing now existing to the hypothetical "Pro-mammalia," and the second that they are not primitive Mammalia

at all. The view held in this volume is that "The general conclusion which best suits the facts at our disposal seems to be to look upon the Cetacea as an off-shoot from an early group of the higher Mammalia. This is unsatisfactory in its vagueness, no doubt; but it is difficult to see what more can be said which is not entirely speculative and devoid of foundation in ascertained fact."

The enumeration of the species is happily treated on the synthetic method, but the question of specific consideration is a complex one. Not only are specimens not easily procurable, but the skeletons of stranded examples do not altogether solve the problem. "Two quite different species might conceivably have a quite similar skeleton, showing their specific difference only in colour and other outward features."

Mr. Beddard has well attained his desire to write "a solid book tempered by anecdote," and to illustrate by the means of Whales "a very important biological generalisation, the intimate relation between structure and environment." The book is well illustrated by Mr. Berridge, and is written throughout with a greater tendency to fact than speculation. On this point the author's words are clear: "Nothing is more difficult in zoology than to arrive at convenient generalisations—for the paradoxical reason that it is so easy to frame hypotheses. The expression 'simplex sigillum veri,' not composed for the purpose for which it is used, and yet used with such frequency in zoological writing, especially in the newer developments of what is called sometimes 'Darwinism,' has had a most deleterious effect upon speculation. A simple and obvious explanation often seems to such writers to settle the question at issue. And yet in the long run it seems to be plain that the processes of nature are not so simple."

British Birds, with some Notes in reference to their Plumage.

Vol. II. By CLAUDE W. WYATT, M.B.O.U. Wm. Wesley & Son.

THE first volume of this beautiful quarto was published in 1894, and was devoted to the resident British Passerine birds. The second volume, now before us, "contains illustrations of all the Passerine Birds which are migrants to the British Islands,—

the Occasional Visitors being left out; also of the Resident and Migrant Picariæ, Striges, Accipitres, and Columbæ, the same reservation being made to the Occasional Visitors." Fifty-three species are figured, and form subjects for forty-two handsome coloured plates.

The story of our British birds has been told in many ways and by many writers. This volume may almost be said to be devoted to their iconography. The author seems to have taken it for granted that there was not much left to be written about his subject, and to have limited himself absolutely to describing the plumage and its seasonal vicissitudes. In this course, individually, he was probably justified; a good book is not necessarily one that exhausts its subject; it should, however, completely deal with its selected theme. We must therefore refer to the illustrations, and by these the work will be known.

The plates all bear the initials of the author, and have evidently proved a labour of love. Not only have we life-like portraits of the birds, but their environment has been sketched in no inartistic manner, and we almost seem to recognize some of the landscapes which an excellent insular prejudice has made us love so well. The homestead behind the Spotted Flycatchers is a case in point, while the background to the Tree-Pipit makes us almost believe we are at home on the Surrey hills. A sketch of the true environment of a bird is no mean hint as to its habits, and, in looking over our skins obtained in other lands, a mental picture of the scenery where it was procured appears to pertain to each specimen. Apart from its value to all lovers of our avifauna, it would perhaps be difficult to select a more acceptable present to a British naturalist residing abroad than this beautiful representation of the well-remembered birds of the old country.

A Manual of Zoology. By the late T. JEFFERY PARKER, D.Sc., F.R.S., and WILLIAM A. HASWELL, M.A., D.Sc., F.R.S. Macmillan & Co. Limited.

In our volume for 1898 (p. 132) we noticed, at such length as is available in our pages, 'A Text-Book of Zoology,' in two volumes, by the above authors. The present publication may be

considered a condensation of the previous work, "adapted to the requirements of the student in higher classes of schools, and to some extent in junior classes of universities." The curtailment has been effected "(1) by leaving out altogether certain classes of existing animals; (2) by omitting all descriptions of extinct groups; (3) by dealing only very briefly with embryology." We may also accept Prof. Haswell as really the writer of this Manual, the death of Prof. Parker having taken place at an initial stage of the work.

Thus we have the essence of a really good book in a convenient form for teachers and students, and if the teacher has not also to learn his subject from its pages—as is unfortunately sometimes the irony of the position—but can really impress its contents on his pupils, then this volume should more than hold its own in that often undigested superstition that rejoices in the name of "science for schools." In these days, when everybody is a politician, a military general, and an evolutionist, it is at least something that the last position can be fortified by the sound zoological axioms obtainable in a small and inexpensive book. Not that the last word is said on any subject; and when we read that the Amphibia differ "from all fishes but the Dipnoi, in the presence of lungs for breathing air in the adult," we accept the rule, but recur to the exception in "Salamanders with and without lungs," recently noticed in these pages (*ante*, p. 96). Even a specialist may read with the greatest interest the introductory remarks as to what constitutes both "genus" and "species," and remember that in the description of the last a representative and not an individual is the real specific type. It is only fair to say that the authors of this volume do not lay down this rule, but the inference may be drawn from their definitions.

The Caroline Islands. By F. W. CHRISTIAN, B.A., &c.
Methuen & Co.

THE South Sea Islands are still, among naturalists, a name to conjure with. In Spanish Micronesia alone, between 139° and 170° E. longitude, are scattered a long chain of 652 islands. It was in this almost zoologically unknown zone that the once princely Hamburg merchant house of Goddeffroy Bros. incited their

employés to collect for their museum, and made their commerce a friendly helper to Natural History. The firm, we believe, no longer exists, but the name of its principals will be long remembered. Commerce and zoology are bad partners; they each exact too much to flourish together; it seems that one alone can succeed. Recently the Sandwich Islands have had their fauna investigated: missionaries from time to time collect in the Lotos lands to which they are not unoften consigned; huge folios still represent the partial work of the old voyagers; but it is probable that much more is known of the Ethnology than of the general Zoology of these lonely islands, where man alone seems to break the peaceful dream of life.

Mr. Christian has written a good book to lift the veil off the Caroline Islands, which he visited rather as a philologist than a zoologist, but has still given us incidentally much valuable information as to that insular natural history. Thus in the appendix we have not only a list of native names for "trees, plants, and shrubs," but also for "fishes, insects, birds, and animals" (*sic*). In the absence of scientific names we cannot of course identify the animals to which the local names apply, but we are able by his descriptions to form an estimate of the fauna and to seek for more precise information. Where the author allows himself to theorize he is always interesting—thus: "It is very remarkable the horror in which Micronesians and Polynesians alike hold Lizards and Eels, and it certainly seems to point to a traditional recollection of the Crocodiles and venomous Serpents they left behind them in the great rivers and jungles of Asia and the larger islands of Indonesia. What proves this so strongly is the fact that Crocodile and Snake names in New Guinea in many instances coincide with Lizard and Eel designations current in the dialects embracing all the isles of the Pacific."

The book is beautifully illustrated, and at p. 125 Mr. Macpherson will find an account of "Traps and Cages." We rise from its perusal with a full measure of the vast potentialities that exist for a naturalist who could spend a greater part of his life on one of these comparatively small islands, investigating the fauna as a whole, with a purview beyond both birds and insects, and pass the close of his days in publishing his life's work—one island, one man, one book.

EDITORIAL GLEANINGS.

PART III. of 'The Vertebrate Fauna of Bedfordshire,' by J. Steele-Elliott, has reached us. The publication has hitherto been slow, but the author hopes to accelerate it in future. Of the Jay (*Garrulus glandarius*) we read that in northern Bedfordshire this bird is particularly abundant, and its depredations noticeable. "In Angers Wood during the present year (1899) I was particularly struck with the innumerable nests of Black-birds and Thrushes, none of which contained eggs, and in all probability had been robbed by these 'avian birds'-nesters."

"THE Caradoc and Severn Valley Field Club" have issued their 'Transactions' for 1899. In the account of a half-day excursion to Birmingham, which was principally undertaken to see the collection of British Birds in the possession of Mr. R. W. Chase, many interesting jottings will be found by the British ornithologist. "There are three specimens of Richard's Pipit, two of them obtained near Birmingham; and the only specimen of the Siberian Bunting obtained in Britain, taken at Flamborough Head."

THE military correspondent of the 'Westminster Gazette' has brought the teachings of zoology to the aid of practical warfare. "I have a theory on this subject which I should much like to see practically tested. My readers will doubtless have noticed that the coats of all animals which depend for their existence on their comparative invisibility in their ordinary surroundings shade off to a lighter colour—usually white—underneath. I believe that, following this hint from Nature, our troops would become infinitely less conspicuous if their coats were of the ordinary shade of khaki or drab, their breeches somewhat lighter in tone, and their putties or leggings lighter still. At present, when men are dressed in one uniform tint of khaki, the lower limbs, being in shadow, appear very much darker, and consequently add to the conspicuousness of the soldier. This will be speedily noticeable if the photographs from the seat of war are studied. It will then be noticed that in many cases the upper halves of our troops are barely distinguishable, but that their lower limbs, much darker than the remainder, stand out quite sharply, though the colour of the clothes and the colour of the background are in each case the same."

